



## DEPARTMENT OF TRANSPORTATION

### Pipeline and Hazardous Materials Safety Administration

#### 49 CFR Parts 107, 171, 172, 173, 178, and 180

[Docket No. PHMSA-2020-0102 (HM-219D)]

RIN 2137-AF49

### Hazardous Materials: Adoption of Miscellaneous Petitions and Updating Regulatory Requirements

**AGENCY:** Pipeline and Hazardous Materials Safety Administration (PHMSA), Department of Transportation (DOT).

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** PHMSA proposes amendments to the Hazardous Materials Regulations (HMR) to update, clarify, improve the safety of, or streamline various regulatory requirements.

Specifically, this rulemaking responds to 18 petitions for rulemaking submitted by the regulated community between May 2018 and October 2020 that requests PHMSA address a variety of provisions, including but not limited to those addressing packaging, hazard communication, and the incorporation by reference of certain documents. These proposed revisions maintain or enhance the existing high level of safety under the HMR while providing clarity and appropriate regulatory flexibility in the transport of hazardous materials.

**DATES:** Comments must be submitted by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. PHMSA will consider late-filed comments to the extent possible.

**ADDRESSES:** You may submit comments by identification of the docket number (PHMSA-2020-0102 [HM-219D]) by any of the following methods:

- *Federal eRulemaking Portal:* Go to [www.regulations.gov](https://www.regulations.gov). Follow the online instructions for submitting comments.

- *Fax:* 1-202-493-2251
- *Mail:* Dockets Management System; U.S. Department of Transportation, Dockets Operations, M-30, Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE, Washington, DC 20590-0001.
- *Hand Delivery:* To U.S. Department of Transportation, Dockets Operations, M-30, Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE, Washington, DC, between 9:00 a.m.–5:00 p.m., Monday–Friday, except Federal holidays.

*Instructions:* All submissions must include the agency name and docket number for this notice at the beginning of the comment. All comments received will be posted without change to the Federal Docket Management System (FDMS), including any personal information.

*Docket:* For access to the dockets to read background documents, including the Preliminary Regulatory Impact Analysis (PRIA) or comments received, go to [www.regulations.gov](http://www.regulations.gov) or DOT’s Docket Operations Office (*see ADDRESSES*).

*Confidential Business Information:* Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA; 5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN” for “proprietary information.” Submissions containing CBI should be sent to Steven Andrews, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington, DC 20590–0001. Any commentary that PHMSA receives that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

**FOR FURTHER INFORMATION CONTACT:** Steven Andrews, 202-366-8553, Office of Hazardous Materials Standards, Pipeline and Hazardous Materials Safety Administration, U.S.

Department of Transportation, 1200 New Jersey Avenue, SE, East Building, 2<sup>nd</sup> Floor,  
Washington, DC 20590-0001.

## **SUPPLEMENTARY INFORMATION:**

### **Table of Contents**

- I. Background
- II. Incorporation by Reference Discussion Under 1 CFR Part 51
- III. Review of Petitions and Issues
- IV. Section-by-Section Review
- V. Regulatory Analyses and Notices
  - A. Statutory/Legal Authority for This Rulemaking
  - B. Executive Order 12866 and DOT Regulatory Policies and Procedures
  - C. Executive Order 13132
  - D. Executive Order 13175
  - E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies
  - F. Paperwork Reduction Act
  - G. Unfunded Mandates Reform Act
  - H. Environmental Assessment
  - I. Environmental Justice
  - J. Privacy Act
  - K. Executive Order 13609 and International Trade Analysis
  - L. Executive Order 13211
  - M. National Technology Transfer and Advancement Act

### **I. Background**

The Administrative Procedure Act requires Federal agencies to give interested persons the right to petition an agency to issue, amend, or repeal a rule (*See* 5 U.S.C. 553(e)). PHMSA regulations specify that persons petitioning PHMSA to add, revise, or remove a regulation in the Hazardous Materials Regulations (HMR; 49 CFR parts 171 through 180) must file a petition for rulemaking containing adequate support for the requested action. (*See* 49 CFR 106.100) PHMSA proposes to amend the HMR in response to petitions for rulemaking submitted by shippers, carriers, manufacturers, and industry representatives, and welcomes petitions from any interested stakeholder or member of the public with suggested changes to improve the HMR.

PHMSA expects that the proposed revisions would maintain the high safety standard currently achieved under the HMR while providing clarity and appropriate regulatory flexibility in the transport of hazardous materials. PHMSA also notes that—insofar as adoption of the

petitions as proposed could reduce delays and interruptions of hazardous materials shipments during transportation—the proposed amendments may also lower greenhouse gas (GHG) emissions and safety risks to minority, low-income, underserved, and other disadvantaged populations and communities in the vicinity of interim storage sites and transportation arteries and hubs. A detailed discussion of the petitions and proposals can be found in Section III of this NPRM.

PHMSA proposes to:

- Allow for appropriate flexibility of packaging options in the transportation of compressed natural gas in cylinders.
- Streamline the approval application process for the repair of specific DOT specification cylinders.
- Provide greater clarity on the filling requirements for certain cylinders used to transport hydrogen and hydrogen mixtures.
- Facilitate international commerce and streamline packaging and hazard communication requirements by harmonizing the HMR with international regulations to allow the shipment of de minimis amounts of poisonous materials.
- Provide greater clarity by requiring a specific marking on cylinders to indicate compliance with certain HMR provisions.
- Streamline hazard communication requirements by allowing appropriate marking exceptions under certain conditions for the transportation of lithium button cell batteries installed in equipment.
- Provide greater flexibility and accuracy in hazard communication by allowing additional descriptions for certain gas mixtures.
- Increase the safe transportation of explosives by updating certain Institute of Makers of Explosives (IME) documents currently incorporated by reference.

- Modify the definition of “liquid” to include the test for determining fluidity (penetrometer test) prescribed in the agreement concerning the International Carriage of Dangerous Goods by Road (ADR).
- Incorporate by reference a Compressed Gas Association (CGA) publication C-20-2014, “Requalification Standard for Metallic, DOT and TC 3-series Gas Cylinders and Tubes Using Ultrasonic Examination,” Second Edition, which will eliminate the need for some existing DOT special permits and allow alternative methods for the requalification of cylinders. This revision would eliminate the need for special permit applications and renewals.<sup>1</sup>
- Incorporate by reference the updated Appendix A of CGA publication C-7-2020, “Guide to Classification and Labeling of Compressed Gases,” Eleventh Edition.
- Incorporate by reference the CGA publication C-27-2019, “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes, First Edition.”
- Incorporate by reference the CGA publication CGA C-29-2019, “Standard for Design Requirements for Tube Trailers and Tube Modules, First Edition.”
- Incorporate by reference the CGA publication CGA V-9-2019, “Compressed Gas Association Standard for Compressed Gas Cylinder Valves, Eighth Edition.”

## **II. Incorporation by Reference Discussion Under 1 CFR Part 51**

According to the Office of Management and Budget (OMB), Circular A-119, “Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities,” Government agencies must use voluntary consensus standards wherever practical in the development of regulations.

---

<sup>1</sup> PHMSA notes that it has received a petition to incorporate by reference the 2021 version of this publication <https://www.regulations.gov/docket/PHMSA-2022-0030/document>. PHMSA is currently conducting a technical review and cost evaluation of this publication. PHMSA welcomes comments, data, and information on whether it should consider incorporating the 2021 version into any final rule.

PHMSA currently incorporates by reference into the HMR all or the relevant parts of several standards and specifications developed and published by standard development organizations (SDO). In general, SDOs update and revise their published standards every two to five years to reflect modern technology and best technical practices. The National Technology Transfer and Advancement Act of 1995 (NTTAA; Pub. L. 104-113) directs Federal agencies to use standards developed by voluntary consensus standards bodies in lieu of government-written standards unless to do so would be inconsistent with applicable law or otherwise impracticable. Voluntary consensus standards bodies develop, establish, or coordinate technical standards using agreed-upon procedures. OMB issued Circular A-119 to implement section 12(d) of the NTTAA relative to the utilization of consensus technical standards by Federal agencies. This circular provides guidance for agencies participating in voluntary consensus standards bodies and describes procedures for satisfying the reporting requirements in the NTTAA. Consistent with the requirements of the NTTAA and its statutory authorities, PHMSA is responsible for determining which currently referenced standards should be updated, revised, or removed, and which standards should be added to the HMR. Revisions to materials incorporated by reference in the HMR are handled via the rulemaking process, which allows the public and regulated entities to provide input. During the rulemaking process, PHMSA must also obtain approval from the Office of the Federal Register to incorporate by reference any new materials. Regulations of the Office of the Federal Register require that agencies detail in the preamble of an NPRM the ways the materials it proposes to incorporate by reference are reasonably available to interested parties, or how the agency worked to make those materials reasonably available to interested parties. (*See* 1 CFR 51.5.)

IME standards are free and accessible to the public on the internet, with access provided through the IME website at [https://www.ime.org/products/category/safety\\_library\\_publications\\_slps](https://www.ime.org/products/category/safety_library_publications_slps). The CGA references are available for interested parties to purchase in either print or electronic editions through the

CGA organization website at <https://portal.cganet.com/Publication/index.aspx>. The UN manual of test and criteria is available at [https://unece.org/fileadmin/DAM/trans/danger/publi/manual/Rev7/Manual\\_Rev7\\_E.pdf](https://unece.org/fileadmin/DAM/trans/danger/publi/manual/Rev7/Manual_Rev7_E.pdf) and The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) can be found at <https://unece.org/about-adr>. The specific standards are discussed in greater detail in the section-by-section review.

The following standards appear in the amendatory text of this document and have already been approved for the locations in which they appear: ASTM D 4359, CGA TB-25, ISO 6406:2005(E), and ISO 16148:2016(E). No changes are proposed.

### **III. Review of Petitions and Issues**

#### **A. Transportation of compressed natural gas/methane in UN pressure receptacles**

In its petition (P-1714),<sup>2</sup> CGA requests that PHMSA consider an amendment to 49 CFR 173.302b to implement packaging restrictions for the transportation of compressed natural gas (CNG) and methane in United Nations (UN) seamless steel pressure receptacles with a tensile strength greater than 950 MPa. For the purposes of the HMR, “UN1971, Methane, compressed” is compressed natural gas that is at least 98 percent methane and free of corroding components. CGA expresses concern regarding the growth in transport of CNG and methane in these packagings and wants to ensure the safety of the receptacles in this service. CGA provides historical context of PHMSA’s predecessor agency imposing similar packaging restrictions for CNG transported in certain DOT specification cylinders (*see* 49 CFR 173.302a(a)(4)). These restrictions were intended to limit the effect of impurities in the CNG, such as hydrogen sulfide, on the structural integrity of the steel used in the manufacture of the cylinders. CGA cites several studies on the corrosive effects of natural gas contaminants on a cylinder and notes that the contaminants are usually noncorrosive in the absence of liquid water. Finally, CGA highlights an October 27, 1977, incident in which two people were killed, four people were injured, and a

---

<sup>2</sup> P-1714 – CGA (PHMSA-2018-0054), <https://www.regulations.gov/docket/PHMSA-2018-0054>.

compressor station was damaged when a DOT specification 3T seamless steel cylinder ruptured while being filled with natural gas contaminated with hydrogen sulfide and water. CGA's specific concern is in regard to UN seamless steel pressure receptacles with ultimate tensile strengths greater than 950 MPa being used for the storage and transportation of CNG because higher strength UN seamless steel pressure receptacles are susceptible to embrittlement from CNG contaminants and embrittlement makes the receptacles more susceptible to fracture.

Currently, use of UN pressure receptacles for CNG and methane in transportation is subject to the general requirements for shipment of compressed gases in 49 CFR 173.301, additional general requirements of UN pressure receptacles in 49 CFR 173.301b, and the filling requirements of cylinders with non-liquefied (permanent) gases in 49 CFR 173.302. However, under current regulations there are no additional requirements specific to the use of UN pressure receptacles in CNG or methane service.

CGA requests that 49 CFR 173.302b be revised to include conditions for the transportation of CNG and methane in UN stainless steel pressure receptacles. The CGA petition states that natural gas/methane can be safely transported in UN/International Organization for Standardization (ISO) steel pressure receptacles under the following conditions: 1) the product is non-liquefied gas; 2) the UN seamless steel pressure receptacle has a maximum tensile strength not greater than 950 MPa (137,750 psig) and bears an "H" mark indicating that the cylinder is manufactured from a specific type of steel that is intended to prevent hydrogen embrittlement; 3) there is a drain tube for each UN tube; and 4) the moisture content and concentration of the corroding components in the product conforms to the requirements in 49 CFR 173.301b(a)(2). Specifically, the requirements in 49 CFR 173.301b(a)(2) state that gases or gas mixtures must be compatible with the UN pressure receptacle and valve materials as prescribed for metallic materials in ISO 11114-1:2012(E). In addition, CGA requests new text that clarifies the requirements for transporting methane gas with a purity of at least 98 percent within a UN seamless steel pressure receptacle.



PHMSA's previously considered this issue under petition P-1661<sup>3</sup> submitted by CGA on July 15, 2015. That petition was denied due to its conflict with the requirements in 49 CFR 173.302a(a)(4) for DOT specification 3AAX and 3T cylinders when used in methane service. Currently, § 173.302a(a)(4) only allows methane that is non-liquefied, has a minimum purity of 98 percent, and is commercially free from corroding components to be filled in specification (3AX, 3AAX, and 3T) cylinders. PHMSA agreed that DOT specification 3T cylinders with a tensile strength in the range of 135-155 kilopounds per square inch (ksi) [931–1,069 megapascals per square inch (MPa)] and steel embrittlement can become a safety issue. However, DOT specification 3AX and 3AAX cylinders typically have strength below 135 ksi (931 MPa), and steel embrittlement is usually not a safety concern. In its denial letter, PHMSA encouraged CGA to consider a revised petition and limit cylinders to steel strengths below 950MPa for UN/International Standards Organization (ISO) cylinders made in accordance with ISO 9899-1 and ISO 11120 standards. This is because had PHMSA proposed P-1661, it would have caused conflicting requirements for methane shipments in specification (3AAX, 3T, etc.) cylinders versus shipments in UN/ISO steel cylinders (ISO 9809-1 and ISO 11120 standards).

In response to PHMSA's denial of P-1661, CGA submitted a new petition (P-1714) that addresses PHMSA's concerns by not including DOT 3T specification cylinders where steel embrittlement poses an unreasonable risk. As a result of PHMSA's technical review of CGA petition (P-1714), and because it requested regulatory amendments for shipment of methane (including CNG with a methane content of 98 percent or greater) only in UN cylinders, PHMSA determined that the proposals in P-1714 would be limited to pressure receptacles where steel embrittlement is not a safety issue. Additionally, PHMSA notes this revision will align HMR references to UN cylinders with equivalent DOT specification cylinders. PHMSA further agrees that CNG, other than methane, can cause steel embrittlement in seamless steel pressure

---

<sup>3</sup> P-1661 – CGA (PHMSA-2015-0169), <https://www.regulations.gov/docket/PHMSA-2015-0169>.

receptacles with tensile strengths greater than 950 MPa. Therefore, PHMSA believes the changes outlined in the CGA petition P-1714 will improve the safe transportation of CNG.

PHMSA conducted an economic review of this petition and expects these proposed amendments would not result in any material changes in costs or operations for market participants because they are accepted industry practices and address an important safety concern. To the degree that market participants are currently transporting low-purity methane in high-tensile strength receptacles, affected participants would be required to use substitute packaging. Similarly, the proposed change may provide safety benefits to the extent there is any noncompliance with the practice presented by CGA. A more detailed discussion of this economic analysis can be found in the PRIA posted in the docket to this rulemaking. DOT seeks comment on the number of shipments that may currently be made where substitute packaging would be required under the proposal.

Therefore, PHMSA has determined that there is merit in the CGA petition to amend the requirements for transporting CNG with methane in certain UN seamless stainless steel cylinders. Amending these requirements will enhance safety by authorizing CNG of less than 98 percent methane only in pressure receptacles where steel embrittlement is unlikely to occur. PHMSA proposes to add § 173.302b(f) to specify these requirements for transporting CNG in UN specification pressure receptacles.

B. Threading and repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles

In its petition (P-1716),<sup>4</sup> FIBA Technologies, Inc. (FIBA) requests PHMSA consider a revision to the requirements for repairing seamless DOT 3-series specification cylinders and seamless UN pressure receptacles manufactured without external threads, and also to authorize the performance of this work without requiring prior approval from PHMSA. Specifically, this

---

<sup>4</sup> P-1716 – FIBA (PHMSA-2018-0074), <https://www.regulations.gov/docket/PHMSA-2018-0074>.

petition requests that PHMSA authorize machining new threads on a previously manufactured seamless cylinder or seamless UN pressure receptacle without requiring an approval. Further, FIBA requests that PHMSA expand the population of UN pressure receptacles eligible for repair work. Regarding external threads, in accordance with the current § 180.212(b)(2), repair work not requiring prior approval is limited to the “rethreading” of DOT specification 3AX, 3AAX, or 3T cylinders or a UN pressure receptacle mounted in multiple-element gas containers (MEGC).<sup>5</sup>

FIBA notes there are older DOT specification 3AAX cylinders that were not equipped with external neck threads at the time of manufacture. These cylinders were manufactured in the 1960s and were mounted onto a semi-trailer by inserting the tube neck into a flange on the semi-trailer bulkhead and then secured in place using set screws. FIBA argues that these methods have been mostly abandoned in favor of a threaded tube neck because a threaded flange and anti-rotation pins provide a more secure connection. Moreover, risk will be reduced by a threaded neck surface and flange connection, rather than a neck with no threads and pins, because the threaded neck and flange more securely mount the cylinders and tubes within the MEGC or motor vehicle (tube trailer or frame). Pins do greater damage to the tube than a threaded neck and flange because of the penetration depth required to achieve a secure connection. Section 180.212(b)(2) already allows the repair of damaged threads, which can be so worn as to be the same as a tube manufactured with no outer diameter neck threads. FIBA argues that there is no difference between threads no longer capable of joining the tube neck to the flange and a tube neck having no threads from the start. The same threading process will be performed on the tube with worn threads as the tube with no threads. Additionally, the same CGA C-23 evaluation process used to determine suitability of the tube neck for rethreading will be used to confirm the suitability of the neck for threading.

---

<sup>5</sup> A multiple-element gas container is an assembly of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of gases.

Based on a technical review of this petition, PHMSA expects that authorizing the threading of DOT 3AX, 3AAX manufactured without external threads, or 3T specification cylinders or UN pressure receptacles would enhance safety by authorizing a more secure method of connecting MEGC pressure receptacles. PHMSA concludes this is an improvement over the previous method of using setscrews to secure the tubes, a process that results in indentations being carved into the tube necks as the tube jostles during transport. Moreover, DOT did not originally authorize the threading of previously manufactured cylinders due to a lack of standardized safe threading practices at the time PHMSA adopted provisions for these cylinders. Lastly, PHMSA determined that the machining of neck threads or rethreading of seamless UN pressure receptacles should be authorized regardless of whether the receptacle is mounted in a MEGC. As such, standardization in the area of cylinder connections is vital to reducing damage to the cylinder necks and thus to reducing hazardous materials releases. In summary, the technical review of this petition expects the proposed revision would improve safety by ensuring a more secure connection to the motor vehicle.

This proposed revision is not expected to impose any costs to industry. Further, it is expected that the proposed changes would provide appropriate regulatory flexibility and potential cost-savings (i.e., avoided costs associated with an unnecessary approval application process or use of an outdated securement method) without any impact on safety. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise § 180.212(b)(2) to allow the machining of external threads on all seamless DOT specification 3AX, 3AAX, or 3T cylinder or a seamless UN pressure receptacle originally manufactured without external threads. Additionally, PHMSA is proposing to authorize the machining of neck threads or rethreading of UN pressure receptacles regardless of whether the receptacle is mounted in a MEGC.

C. Clarification of the requirements for certain non-liquefied compressed gases

In its petition (P-1717),<sup>6</sup> FIBA requests that PHMSA consider an amendment to 49 CFR 173.302a(c) of the HMR for the special filling limits for DOT specification 3A, 3AX, 3AA, and 3AAX cylinders containing Division. 2.1 (flammable) gases. Final rule HM-233F<sup>7</sup> adopted Department of Transportation Special Permit (DOT-SP) 6530<sup>8</sup> into the HMR. This revision authorized the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to 10 percent in excess of their marked service pressure. As part of the HM-233F final rule, PHMSA adopted safety control measures in paragraph (c)(3) of 49 CFR 173.302a instead of paragraph (c). In its petition, FIBA requests that PHMSA amend 49 CFR 173.302a(c)(3) to clarify that the requirements in 49 CFR 173.302a(c)(3)(i)-173.302a(c)(3)(ii) are independent provisions. FIBA asserts this proposed revision will accurately reflect the technical conditions associated with the design and manufactured properties of DOT specification 3A, 3AX, 3AA, and 3AAX cylinders.

FIBA also submitted petition (P-1725)<sup>9</sup> requesting further amendments to § 173.302a(c), concurrent with those requested in P-1717. Specifically, FIBA requests that the plus sign (+) be added following the test date marking on a DOT specification 3A, 3AX, 3AA, and 3AAX cylinder filled with hydrogen or mixtures of hydrogen with helium, argon, or nitrogen to signify that the cylinder may be filled to 10 percent in excess of its marked service pressure.

Furthermore, the petition requests that cylinders qualifying for the special filling limit in § 173.302a(c) also be equipped with a pressure relief device (PRD) in accordance with CGA S-1.1 (2011), rather than the requirements in § 173.302a(c)(4), which could potentially conflict with each other. CGA S-1.1 prescribes standards for selecting the correct PRD to meet the requirements of § 173.301(f) for more than 150 gases. It also provides guidance on when a PRD

---

<sup>6</sup> P-1717 – FIBA (PHMSA-2018-0075), <https://www.regulations.gov/docket/PHMSA-2018-0075>.

<sup>7</sup> 81 FR 3635 (Jan. 21, 2016).

<sup>8</sup> DOT SP-6530, <https://cms7.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP6530.pdf/2018019065/SP6530>.

<sup>9</sup> P-1725 – FIBA (PHMSA-2018-0112), <https://www.regulations.gov/docket/PHMSA-2018-0112>.

can be optionally omitted and when its use is prohibited, as well as direction on PRD manufacturing, testing, operational parameters, and maintenance. At the time FIBA submitted P-1725, CGA S-1.1 (2011) had not been incorporated by reference into the HMR. Since then, the HM-234 final rule<sup>10</sup> was published, which incorporated by reference CGA S-1.1 (2011) into the HMR and outlines the PRD requirements for cylinders filled with a gas and offered for transportation.

The plus sign marking (+) is associated with a commonly applied provision in the HMR that authorizes a DOT specification cylinder to be filled to 10 percent in excess of its marked pressure. FIBA states that the plus sign marking (+) is an important means of communicating to cylinder refillers that a cylinder can be filled to 10 percent more than its marked service pressure and, thus, should be added to the special filling requirements in § 173.302a(c).

PHMSA conducted a technical review of the proposals in both petitions along with DOT-SP 6530 and the HM-233F final rule. After this review, PHMSA agrees with FIBA that the safety control measures within DOT-SP 6530 were independent provisions. PHMSA intended to adopt those provisions into the HMR as independent provisions and inadvertently adopted two of the safety controls in §§ 173.302(c)(3)(i) and (ii) as paragraphs of § 173.302a(c)(3). In addition, PHMSA concurs that the proposed revisions to require the plus sign (+) on DOT specification 3A, 3AX, 3AA, and 3AAX cylinders filled with hydrogen or mixtures of hydrogen with helium, argon, or nitrogen would improve the safety of filling these cylinders by providing clarity on the conditions for special filling limits and helping prevent the overfilling of unauthorized cylinders. Finally, PHMSA agrees that cylinders in hydrogen service that are filled to 10 percent in excess of its marked pressure should be equipped with a PRD that is selected as to type, location, and quantity, and tested in accordance with CGA S-1.1 in the same manner as is generally required for cylinders filled with a gas in accordance with § 173.301(f) instead of § 173.302a(c)(4). PHMSA determined that CGA S-1.1 provides much greater specificity than § 173.302a(c)(4)

---

<sup>10</sup> 85 FR 85380 (Dec. 28, 2020).

about the type of pressure relief device required for a particular gas service. Therefore, PHMSA proposes to remove the PRD requirements of 49 CFR 173.302a(c)(4) and instead require compliance with the PRD requirements of 49 CFR 173.301(f). This latter provision requires that, with certain exceptions, a cylinder filled with a gas and offered for transportation must be equipped with one or more PRDs sized and selected as to type, location, and quantity, and tested in accordance with CGA S-1.1.

The proposed amendments associated with P-1717 would provide greater clarity on requirements for cylinder design and manufacture, and would not represent any incremental, quantifiable safety effects because PHMSA already authorizes the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to more than 10 percent of their marked service pressures. These proposed amendments would also not impose any new or incremental cost because they merely reorganize the regulations for clarity. Additionally, while the proposed amendments associated with P-1725 would create a new requirement, PHMSA anticipates the amendment would result in only minimal incremental costs to the industry, and impose only minimal, regulatory burden on small businesses or other entities. The additional request that the cylinders qualified for the special filling limit be equipped with pressure relief devices in accordance with CGA S-1.1 is not expected to add any additional cost on affected industries or entities. Currently, § 173.302a(c)(4) contains the same requirements as CGA S-1.1 and therefore the addition of the CGA S-1.1 requirement will not cause any new additional costs beyond those already accounted for previously. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise § 173.302a(c) to reflect the safety provisions currently in § 173.302a(c)(3)(i) and (ii) are independent material construction requirements under paragraph (c) as new paragraphs (c)(4) and (5). Moreover, PHMSA proposes to add a requirement in § 173.302a(c)(7) to require the plus sign (+) following the test date marking to

indicate compliance with paragraph (c) indicating that the cylinder is allowed to be filled to more than 10 percent of its marked service pressure. Lastly, PHMSA proposes to replace the PRD requirements—found in current § 173.302a(c)(4)—with a new § 173.302a(c)(6). The new provision would require that cylinders must be equipped with PRDs sized and selected as to type, location, and quantity and tested in accordance with CGA S-1.1 (2011) and § 173.301(f).

D. *De minimis* quantities of poisonous materials

In its petition (P-1718),<sup>11</sup> the Council on Safe Transportation of Hazardous Articles, Inc. (COSTHA) requests that PHMSA amend § 173.4b to harmonize the *de minimis* exceptions for Division 6.1, Packing Group (PG) I (no inhalation hazard) materials with international regulations, including the International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) and the International Maritime Dangerous Goods Code (IMDG Code). The *de minimis* exceptions in the HMR provide relief from the general requirements of the HMR for certain hazardous materials shipped in extremely small quantities. The maximum quantity allowed in order to utilize the *de minimis* exception per inner receptacle is 1 mL for authorized liquids and 1 g for authorized solids. Additionally, the aggregate quantity per package may not exceed 100 mL for liquids and 100 g for solids. The exception also requires cushioning and package testing requirements, along with specific provisions for certain materials.

International harmonization includes adopting changes in the HMR to improve regulatory consistency with international regulations and standards, such as the IMDG Code, the ICAO TI, and the UN Recommendations on the Transport of Dangerous Goods - Model Regulations (UN Model Regulations). Harmonization facilitates international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements for transportation of hazardous materials. Safety is enhanced by creating a uniform framework for compliance. As

---

<sup>11</sup> P-1718 – COSTHA (PHMSA-2018-0077), <https://www.regulations.gov/docket/PHMSA-2018-0077>.



the volume of hazardous materials transported in international commerce continues to grow, harmonization is increasingly important. Moreover, the Federal Hazardous Materials Transportation Law (49 U.S.C. 5101 *et seq.*) directs PHMSA to participate in relevant international standard-setting bodies and promotes consistency of the HMR with international transport standards to the extent practicable.

The exceptions in the HMR for *de minimis* quantities were initially adopted in the HM-224D/HM-215J final rule<sup>12</sup> in § 173.4b of the HMR and were intended to align with the provisions for *de minimis* exceptions found in the ICAO Technical Instructions and IMDG Code. However, HM-224D/HM-215J addressed exceptions for *de minimis* quantities of only Division 6.1, PG II and PG III hazardous materials. As noted in the PHMSA Letter of Interpretation (LOI) reference number (Ref. No.) 17-0138,<sup>13</sup> PHMSA considered exceptions for *de minimis* quantities of only Division 6.1, PG II and PG III hazardous materials in response to a petition for rulemaking. PHMSA now proposes harmonizing the *de minimis* provisions for Division 6.1, PG I (no inhalation hazard) materials with the ICAO TI or IMDG Code in this NPRM, in response to COSTHA's petition.

The COSTHA petition to harmonize the scope of the applicability of the *de minimis* exceptions with international standards by including Division 6.1, PG I materials (no inhalation hazard) would except *de minimis* shipments from the hazardous communication requirements otherwise associated with these shipments. A technical review of this petition found the inclusion of *de minimis* quantities for Division 6.1, PG I (no inhalation hazard) materials into the international regulations can be traced back to working paper ST/SG/AC.10/C.3/2009/45,<sup>14</sup> which was submitted by the United States. Based on the review of this working paper, PHMSA

---

<sup>12</sup> 74 FR 2200 (Jan. 14, 2009).

<sup>13</sup> PHMSA LOI 17-0138, <https://www.phmsa.dot.gov/regulations/title49/interp/17-0138>.

<sup>14</sup> Working paper ST/SG/AC.10/C.3/2009/45, <https://unece.org/DAM/trans/doc/2009/ac10c3/ST-SG-AC10-C3-2009-45e.pdf>.

asserts that Division 6.1, PG I (no inhalation hazard) materials should be included as part of the *de minimis* exception.

The primary concern regarding the transportation of a Division 6.1, PG I (no inhalation hazard) material is leakage from a package and potential human exposure. A leak of such a material poses a risk to human health by poisoning. To counter these concerns, this hazard is mitigated by the conditions for transportation in the *de minimis* exceptions, namely, imposing limitations on the quantities allowed to 1 mL or 1 g per inner receptacle. In addition, 49 CFR 173.4b requires that inner receptacles have removable closures sealed by wire, tape, or other positive means (*see* § 173.4b(a)(2)), which limits the possibility for leakage. Furthermore, a Division 6.1 PG I material that does not pose an inhalation hazard equally poses no vaporization risk should the package rupture. Lastly, *de minimis* packages are required to have cushioning and absorbent material that are not reactive with the hazardous material and can absorb the entirety of the package's contents if the receptacle ruptures. These requirements severely limit the risk of exposure presented by transportation of these materials.

While maintaining safety as described in the prior paragraph, the proposed harmonization would not impose any direct costs on industry and could provide cost savings to shippers by providing the option to ship Division 6.1, PG I (no inhalation hazard) materials under the *de minimis* provisions that provide alternative communication and packaging requirements associated with the preparation of these packages. In total, PHMSA estimates that the proposal would result in cost savings of approximately \$160,000 annually. A more detailed discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, upon review of the COSTHA petition to revise the *de minimis* quantities exception to include Division 6.1, PG I materials (no inhalation hazard), PHMSA proposes to revise § 173.4b to include Division 6.1, PG I materials (no inhalation hazard) to the list of authorized materials in § 173.4b(a) PHMSA expects expanding the *de minimis* exceptions to

Division 6.1, PG I materials (no inhalation hazard) to maintain the safety of transportation of hazardous materials and provide cost savings through alternative packaging options.

E. Clarification of the marking requirements for button cell lithium batteries contained in equipment

In its petition (P-1726),<sup>15</sup> COSTHA requests that PHMSA amend 49 CFR 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are excepted from the marking requirement and not subject to the quantity per package or per consignment limitation. Currently, § 173.185(c)(3) states that, “Each package must display the lithium battery mark except when a package contains button cell batteries installed in equipment (including circuit boards), or no more than four lithium cells or two lithium batteries contained in equipment, where there are not more than two packages in the consignment.” In its petition, COSTHA asserts that the language and grammar used to convey the exception from display of the lithium battery mark has led some in industry to interpret the exception for button cell batteries to be dependent on the number of cells in a package or the number of packages in the consignment. Industry has made several requests for letters of interpretation—12-0261,<sup>16</sup> 14-0013,<sup>17</sup> 15-0171,<sup>18</sup> and 16-0172<sup>19</sup>—which illustrates the confusion within the regulated community.

PHMSA published final rule HM-224F<sup>20</sup> to revise the HMR applicable to the transport of lithium cells and batteries, consistent with the UN Model Regulations, the ICAO Technical Instructions, and the IMDG Code. As part of final rule HM-224F, PHMSA consolidated the requirements for shipping and transporting lithium cells and batteries into § 173.185 by:

---

<sup>15</sup> P-1726 – COSTHA (PHMSA-2019-0002), <https://www.regulations.gov/docket/PHMSA-2019-0002>

<sup>16</sup> PHMSA LOI 12-0261;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretations/2012/120261.pdf>.

<sup>17</sup> PHMSA LOI 14-0013;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2014/140013.pdf>.

<sup>18</sup> PHMSA LOI 15-0171;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2016/150171.pdf>.

<sup>19</sup> PHMSA LOI 16-0172;

<https://cms7.phmsa.dot.gov/sites/phmsa.dot.gov/files/legacy/interpretations/Interpretation%20Files/2017/160172.pdf>.

<sup>20</sup> 79 FR 46011 (August 6, 2014).

- Requiring cells and batteries to be tested in accordance with the latest revisions to the UN Manual of Tests and Criteria and requiring manufacturers to retain evidence of successful completion of UN testing.
- Eliminating the exceptions for small cells and batteries in air transportation, except with respect to extremely small cells packed with or contained in equipment.
- Providing relief for (1) the shipment of low production run and prototype batteries and, (2) batteries being shipped for recycling or disposal.

In its petition, COSTHA presents grammatical and typographical changes to § 173.185(c)(3) to clarify the applicability of the lithium battery mark exception for button cell batteries installed in equipment. Consistent with the petition, PHMSA proposes revisions that clarify the exception in § 173.185(c)(3) applies when a package contains only button cell batteries installed in equipment; or when there is a consignment consisting of two packages or less, and each package contains no more than four lithium cells or two batteries installed in equipment.

This proposed change to the HMR is neither expected to result in a cost to industry nor a change to the safety requirements for packages containing lithium button cell batteries contained in equipment. The proposed revision simply clarifies how the exception is applied for better understanding by the reader. Since PHMSA already authorizes this lithium battery mark exception, the proposed change would not represent a quantifiable safety effect. Qualitatively, improved regulatory clarity will assist the regulated community in complying with the requirement and properly exercising the exception. Some entities were reasonably confused by the current text and applied the required mark unnecessarily. To the extent this occurred, the proposed revision could provide economic benefit while maintaining safety. PHMSA believes there is limited risk in excepting packages of button cell lithium batteries installed in equipment from the lithium battery mark. A more detailed discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise the introductory language in 49 CFR 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are not subject to any quantity per package or consignment limitations when applying the exception.

F. Incorporate by reference CGA C-20 (2014)

In its petition (P-1727),<sup>21</sup> CGA requests that PHMSA incorporate by reference CGA C-20 (2014), “Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition.” CGA also proposes to revise § 180.205 to reflect the ultrasonic examination (UE) methods authorized by CGA C-20. CGA C-20 are an industry standard for the periodic requalification of certain metallic DOT and Transport Canada (TC) 3-series cylinders and tubes. CGA asserts that the incorporation by reference of CGA C-20 would eliminate the need for many special permits that authorize the use of UE methods and would harmonize the various UE methods to requalify these pressure receptacles. CGA further asserts that this standard would establish a uniform set of techniques, uniform acceptance and rejection criteria, and a standard calibration method used during the requalification process of these 3-series gas cylinders and tubes, in contrast to the current special permits, which vary on the requirements associated with use of the UE nondestructive testing methodology for requalification. Finally, the petition asserts that the incorporation by reference of CGA C-20 would enhance public safety by clarifying and mandating consistent requalification practices using UE throughout the gas industry.

CGA C-20 identifies and describes the various acceptable UE methods that may be used in place of the baseline HMR requirements (e.g., internal visual inspection and hydrostatic requalification methods) used to examine certain metallic DOT/TC 3-series gas cylinders and tubes. This standard also specifies the allowable flaw acceptance/rejection criteria.

---

<sup>21</sup> P-1727 – CGA (PHMSA-2019-0007), <https://www.regulations.gov/docket/PHMSA-2019-0017>.

Under the HMR, requalification periods for DOT/TC 3-series specification cylinders range from three to 12 years, depending on the specification under which each cylinder was made (e.g., 3, 3AA, etc.). Periodic requalification ensures the safety of cylinders by checking for leaks and damage that might threaten the integrity of a cylinder. Cylinders are requalified using volumetric expansion testing, proof pressure testing, and external and internal visual inspections. Currently, special permits are required to use UE in lieu of the requalification requirements in § 180.205.

CGA notes that the increased use of UE necessitates clear and consistent instruction in the application of this technical method, as well as the adherence to proper calibration and acceptance/rejection criteria. CGA asserts that the proposed modifications ensure that this requalification method is applied consistently to safeguard cylinder serviceability.

PHMSA participated in the task force meetings, provided technical assistance during the development of CGA C-20, and completed a technical review of the final standard. PHMSA's technical review determined that the CGA C-20 standard will positively impact safety by prescribing appropriate procedures for applying UE as the requalification method for DOT/TC 3-series cylinders and tubes.

The total cost savings for industry regarding requalification using CGA C-20 is based on the number of active special permits and the costs associated with periodic renewal of the special permit. We estimate average annual industry cost savings of \$14,613 due to companies no longer being required to apply for a special permit. A more detailed discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

PHMSA also proposes to revise 49 CFR 180.205(i) to state that when a cylinder containing hazardous materials is condemned, the requalifier must stamp the cylinder "CONDEMNED" and affix a readily visible label on the cylinder stating: "UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION." PHMSA also is clarifying that the requalifier may only transport the condemned cylinder by private motor vehicle carriage to a

facility capable of safely removing the contents of the cylinder. PHMSA also notes the publication of the third edition of CGA-20 in 2021 and solicits comment regarding whether this rulemaking should consider incorporating by reference the 2021 edition rather than the 2014 edition. Therefore, PHMSA proposes to add a reference to CGA C-20, “Methods For Ultrasonic Examination Of Metallic, DOT And TC 3-Series Gas Cylinders And Tubes, Second Edition” in 49 CFR 171.7 and revise 49 CFR 180.205 to reflect the UE methods authorized by CGA C-20.

G. Gas mixtures containing components defined as liquefied gases

In its petition (P-1728),<sup>22</sup> CGA proposes that PHMSA authorize an alternative description of gas mixtures containing components defined as liquefied gases. The CGA petition would revise the HMR to allow for a gas mixture with components that meet the definition of liquefied compressed gas in § 173.115(e) to be described as a “compressed gas” when the partial pressures of the liquefied gas components of the mixture are intentionally reduced so that liquefaction does not occur at 20°C (68°F). CGA requests in its petition that special provisions be added to Column 7 in the § 172.101 Hazardous Material Table (HMT) applicable to liquefied gas mixtures.

Some compressed gas mixtures contain components that when shipped in their pure form would be considered a liquefied gas. However, when the gas is in a mixture, it can be manipulated to be entirely gaseous at its intended use temperature of 20°C (68°F) by reducing the components’ partial pressures. Partial pressure is the pressure that would be exerted by one of the gases in a mixture if it occupied the same volume on its own. The sum of all components’ partial pressures equals the total pressure of the mixture. Therefore, partial pressure can be lowered by lowering pressure generally (e.g., by lowering temperatures or increasing volume) or altering the ratio of gases in the mixture.

PHMSA conducted a technical review of this petition and agrees with CGA that when the gas is in a mixture, it can be manipulated to be entirely gaseous at its intended use temperature of

---

<sup>22</sup> P-1728 – CGA (PHMSA-2019-0018), <https://www.regulations.gov/docket/PHMSA-2019-0018>.

20°C (68°F) by reducing the components' partial pressures. PHMSA notes that during transportation, the gas mixture or its components may partially liquefy, forming condensation on the container wall, if ambient temperatures are lower than 20°C (68°F), but still above -50°C (-58°F). When the mixture returns to its use temperature, the condensation will transform back to the gaseous state. There are scenarios where a gas mixture might contain a component that meets the definition of a liquefied compressed gas, and under small temperature changes, a cloud or condensation could build up inside the cylinder. This could lead to the "liquefied compressed gas" description potentially misrepresenting the cylinder's contents to first responders and end users. Moreover, while CGA does not cite a safety concern with the current requirements under the HMR, they do note that there can be confusion among stakeholders when the content of a cylinder is described as a liquefied compressed gas but resembles a non-liquefied compressed gas during transportation and use. Thus, PHMSA has determined that the proposed change is safety neutral or slightly improves safety. However, PHMSA disagrees with the CGA petition to use a special provision to allow for the description of a gas mixture with components that meet the definition of liquefied compressed gas to be described as a "compressed gas." Instead, PHMSA believes that the most appropriate change is to amend the definition of a non-liquefied compressed gas in § 173.115(e), as revising the regulatory text provides a clearer connection for all stakeholders who ship these gases. Nonetheless, PHMSA appreciates any comments on this proposal.

This revision to the HMR is not expected to result in any cost to industry or impose any regulatory burden on small businesses. Given that industries already must describe shipments of these materials on a shipping paper and communicate information about the material and the hazard on the package, there would be little to no cost on entities to change the hazard communication. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.



Therefore, PHMSA proposes to allow certain mixtures of gas with component(s) considered liquefied gas in accordance with 49 CFR 173.115(e) to be described as a “compressed gas” and considered a non-liquefied gas in accordance with § 173.115(d). PHMSA proposes to revise § 173.115(e) to clarify that gas mixtures with component(s) considered liquefied gases may be described using the appropriate hazardous materials description of a non-liquefied compressed gas in 49 CFR 172.101 HMT when the partial pressure(s) of the liquefied gas component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at 20°C (68°F).

H. Incorporate by reference CGA C-23 (2018)

In its petition (P-1729),<sup>23</sup> CGA proposes that PHMSA incorporate by reference CGA C-23 (2018), “Standard for Inspection of DOT/TC 3 series and ISO 11120 Tube Neck Mounting Surfaces, Second Edition” into 49 CFR 171.7 of the HMR. CGA also proposes that PHMSA revise 49 CFR 180.205 and 180.207 to reference the requirements in CGA C-23. CGA C-23 defines a tube as a seamless pressure vessel authorized for transportation only when horizontally mounted on a motor vehicle or in an International Organization for Standardization (ISO) framework. Tube modules are also commonly known as skid containers, ISO skids, ISO containers, or multiple-element gas containers (MEGCs). Sections 180.205 and 180.207 outline the general requirements for the requalification of specification cylinders and UN pressure receptacles. The CGA petition would require all requalifiers of tube trailers, skid containers, or MEGCs to periodically disassemble equipment and perform an examination of tube neck mounting surfaces in accordance with CGA C-23.

These tubes are typically mounted to a semitrailer by engaging the threaded surface on either end of the tube with flanges built into the bulkheads located on opposing ends of the trailer. Although secured in place, these mounting points support the full weight of the tube and

---

<sup>23</sup> P-1729 – CGA (PHMSA-2019-0059), <https://www.regulations.gov/docket/PHMSA-2019-0059>.

during transportation are subjected to jostling, temperature changes and all the dynamic forces associated with the acceleration/deceleration of the transport vehicle. Consequently, the constant motion and wear between the tube's threaded mounting surfaces and the flanges causes, over time, the deterioration of the mounting threads. This deterioration necessitates the periodic disassembly of the tubes from the trailer to inspect them. Therefore, CGA C-23 provides instructions on how to inspect and evaluate DOT/TC 3-Series and ISO 11120 tubes that are 12 ft (3.7 m) or longer, have an outside diameter greater than or equal to 18 inches (457 mm), and are supported by a neck mounting surface. In addition, CGA C-23 provides methods to assess the integrity of tube necks, including but not limited to damage to mounting threads or to pin or set screw marks, as well as other damage. The assessment as outlined in C-23 provides a method for the identification of rejected tubes so that they can be removed from service, thereby improving the safe transportation of these horizontally-mounted cylinder types.

CGA C-23 was developed in response to an incident where a DOT specification 3AAX cylinder was ejected from a semitrailer and ruptured upon initial impact with the roadway. CGA determined that the root cause of the ejection, which contributed to the severity of the incident, was the condition of the connection between the tube neck and flange. CGA asserts that CGA C-23 will enhance the inspection process to include the inspection of the tube mounting and replacement of flanges.

The HMR currently do not reference CGA C-23, but PHMSA references the standard as a safety control in DOT special permits, such as DOT SP-14206.<sup>24</sup> These special permits allow for the requalification of DOT specification cylinders and UN tubes by UE or acoustic emission testing (AET), with a follow-up UE instead of the hydrostatic test currently required under the HMR. These methods are used to ensure the cylinders and tubes remain qualified for hazardous materials service. Moreover, the UE and AET methods are non-destructive methods of

---

<sup>24</sup> DOT SP-14206, <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP14206.pdf/offerserver/SP14206>.

examination, that are alternatives to the hydrostatic method. Additionally, the HMR do not require periodic inspection and evaluation of the tube neck mounting surfaces. The CGA petition would enhance transportation safety of these larger cylinders and tubes by including inspection of the tube mounting threads as part of the requalification process.

The proposed new language from CGA would require both specification DOT 3-series and UN tubes that are 12 feet or longer, with an outside diameter greater than or equal to 18 inches and supported by the neck mounting surface during transportation in commerce, to be inspected at least every 10 years in accordance with CGA C-23. CGA also proposes new language in 49 CFR 180.205(d) and 180.207(d) to require DOT 3-series and UN tubes that show evidence of corrosion to the neck threads to be removed and examined in accordance with CGA C-23 before being rejected or returned to service.

PHMSA conducted a technical review of the CGA petition and determined that the incorporation by reference of CGA C-23 will enhance safety by implementing a periodic inspection of the mounting of these tubes. Moreover, the requirements of CGA C-23 are consistent with the safety controls referenced in DOT-SP 14206. There are also improvements offered by the CGA C-23 standard versus the procedures outlined in DOT-SP 14206, such as a table that contains specific dimensional values for use in defining acceptance criteria for tubes with local thin areas (LTA). However, PHMSA found the CGA proposals in §§ 180.205(d)(5) and 180.207(d)(1)(iii) requiring the disassembly of the tube module when visible corrosion in the neck region is present to be too vague. Therefore, PHMSA is referencing the figures and descriptions provided in Section 4.2 of the CGA C-23 standard for extreme neck thread wear conditions in §§ 180.205(d)(5) and 180.207(d)(1)(iii) to clarify conditions when disassembly of the tube module is required.

PHMSA has determined that incorporating by reference CGA C-23 into the HMR would enhance safety for industry and stakeholders by codifying the tube neck thread inspection procedures. PHMSA estimates there will be a one-time cost for industry participants to purchase

the CGA C-23 standard. With respect to inspections, there may be some minimal administrative costs associated with special permit holders' permits to reflect the codification of CGA C-23-2018 into the code, but these special permit holders should have been following the requirements of CGA C-23-2018 already. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise 49 CFR 171.7 to incorporate by reference CGA C-23 "Standard for Inspection of DOT/TC 3-Series and ISO 11120 Tube Neck Mounting Surfaces, 2nd Edition." PHMSA also proposes to add 49 CFR 180.205(c)(5) to state that DOT 3-series cylinders horizontally mounted on a motor vehicle or in a framework, and longer than 12 feet shall be inspected in accordance with CGA C-23 every 10 years; and add 49 CFR 180.205(d)(5) to specify conditions (as outlined in Section 4.2 of CGA C-23) requiring removal and inspection in accordance with CGA C-23. The current 49 CFR 180.205(d)(5) requiring testing and inspection if the Associate Administrator determines that the cylinder may be in an unsafe condition is renumbered as paragraph (d)(6). PHMSA is also proposing to revise 49 CFR 180.205(i)(2)(i)(C) to state that the requalifier must stamp the cylinder "CONDEMNED" and affix a readily visible label on the cylinder stating: "UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION" for a condemned cylinder contains hazardous materials. The requalifier may only transport the condemned cylinder by private motor vehicle carriage to a facility capable of safely removing the contents of the cylinder. Finally, PHMSA proposes to add 49 CFR 180.207(d)(1)(ii) to state that steel UN tubes horizontally mounted on a motor vehicle or in a framework, and longer than 12 feet shall be inspected in accordance with CGA C-23 every 10 years; and to specify conditions (as outlined in Section 4.2 of CGA C-23) requiring removal and inspection in accordance with Section 6 of CGA C-23. (The text at the current 49 CFR 180.207(d)(1) would be renumbered as paragraph (d)(1)(i)).

I. Incorporate by reference IME Safety Library Publication 23 (SLP-23)

In its petition (P-1731),<sup>25</sup> the IME proposes that PHMSA incorporate by reference an updated version of IME SLP-23 (2021), titled “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging.” IME states that these revisions and improvements to the standard reflect technological advances and best practices in the industry that will maintain a high level of safety.

SLP-23 (2021) outlines the requirements for transporting certain explosives and ammonium nitrate emulsions, classified as oxidizers, to ensure their safe and efficient transport in bulk packagings by highway, vessel, and rail. These bulk packagings can either be DOT specification or non-DOT specification packagings (e.g., cargo tanks or portable tanks) adapted to accommodate the physical and chemical properties of the bulk explosives, oxidizers, or fuel oil transported. SLP-23 (2021) makes several non-substantive changes and editorial clarifications from the previous publication. Non-substantive changes include changing the structure of SLP-23 to read more consistently with the HMR and editorial revisions.

Substantive changes to SLP-23 (2021) include:

- Deletion of the Vented Pipe Test (VPT) in Appendix A

Currently, SLP-23 (2011) requires both bulk Division 1.5 explosives and Division 5.1 ammonium nitrate emulsions to pass the VPT. The proposed updated SLP-23 removes the VPT test for these materials. IME asserts that the VPT is not applicable to Division 5.1 and Division 1.5 materials and adds that as outlined in portable tank instruction TP 32 (applicable to UN0331, UN0332, and UN3377 materials), the VPT is required only to demonstrate suitability for containment in tanks as an oxidizer for ammonium nitrate-based emulsions (ANEs) classified as Division 5.1, UN3375. Additionally, IME notes that a significant change to the requirements applicable to the testing of ANEs was approved by the UN Sub-Committee of Experts on the Transport of Dangerous Goods at its 54th Session (Nov/Dec 2018). Under the new testing

---

<sup>25</sup> P-1731 – IME (PHMSA-2019-0062), <https://www.regulations.gov/docket/PHMSA-2019-0062>.

regime, acceptance criteria will require passing either test series 8(a), 8(b), and 8(c), or if the substance fails the 8(c) test (i.e., the “Koenen Test”) and the substance had a time to reaction in that test longer than 60 seconds and a water content greater than 14 percent, the material would be required to pass test series 8(a), 8(b), and 8(e). Test 8(e) is the Minimum Burning Pressure test (MBP). IME noted that industry is currently gathering data to determine whether use of the MBP test obviates the need for the VPT because, in essence, the VPT is a scaled-up Koenen Test and, therefore, has the same limitations associated with extended time of heating.

- Allowing operators to continually monitor driver qualifications and training instead of conducting an annual audit, as currently required in SLP-23 (2011).

IME notes that the current requirement for an “annual audit” is inadequate to ensure that driver qualification and training programs are comprehensive, effective, and being implemented properly. IME believes that limiting oversight of the program to an annual audit provides less assurance that operators are compliant than would a requirement to continually monitor the driver qualification program.

In addition, IME requests revisions to the HMR that coincide with the incorporation by reference of SLP-23 (2021). IME requests the adoption of DOT-SP 8723, which authorizes “UN0332, Explosive, Blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid n.o.s. (PG II)” to be transported in IM 101 and 102 portable tanks. IME explains that continuing to operate under DOT-SP 8723 imposes additional administrative costs to both industry and PHMSA and that one of the advantages of incorporating by reference SLP-23 (2011) into the HMR was the elimination of SPs governing bulk transportation of certain materials manufactured and used by the commercial explosives industry. IME asserts that failure to include the provisions from DOT-SP 8723 was an oversight when SLP-23 (2011) was originally incorporated by reference into the HMR. In addition to the administrative cost savings noted above, IME adds that the conversion of SPs into regulations provides certainty to the regulated community and increases transparency for government, stakeholders, and the public.

IME proposes that TP codes be assigned to “UN0332, Explosive, blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid, n.o.s., PG II” to authorize the use of IM 101 and 102 portable tanks when transported under SLP-23 (2021). Lastly, IME proposes a revision to § 173.251 to state that this section is not applicable when UN3375 is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).

PHMSA conducted a technical review of the revisions to SLP-23 (2021) and concurs with IME that most of the changes in IME SLP-23 (2021) are either non-substantive or editorial in nature. PHMSA does not believe, however, that sufficient data was provided by IME to no longer require the VPT for Division 1.5 blasting explosives and Division 5.1 ANEs when transported in bulk. While it is true that the UN Subcommittee has discussed whether the VPT is beneficial for ANEs when transported in bulk, the discussions are still in preliminary stages and pending further review by the UN Subcommittee. If these provisions are adopted by the UN, PHMSA may consider changes to VPT requirements in a future international harmonization rulemaking. Additionally, if data can be provided in response to this NPRM that demonstrate that the VPT is no longer needed for these materials, PHMSA can consider such data in the development of the final rule. In this NPRM, PHMSA proposes to retain the requirement that Division 1.5 blasting explosives and Division 5.1 ANEs are subject to the VPT, and we have proposed to add a reference to the UN Test Series 8(d) in 49 CFR 171.7(dd)(5) and 172.102(c)(1), SP 148.

PHMSA also concurs with IME that an annual audit is inadequate to ensure that driver qualification and training programs are comprehensive, effective, and being implemented properly. A continual monitoring program better ensures compliance with the driver qualification requirements. While the timing of the oversight of requirements would change—i.e., continuous monitoring instead of an annual audit—the current elements of the qualification and training program would remain unchanged.

Lastly, PHMSA concurs that there is sufficient merit to adopt the provisions of DOT-SP 8723 to authorize “UN0332, Explosive, blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid, n.o.s., PG II” to be transported in IM 101 and 102 portable tanks when shipped under SLP-23 (2021). This would include a conforming revision to indicate that 49 CFR 173.251 does not apply when UN3375 material is transported in IM 101 or 102 portable tanks in accordance with SLP-23. PHMSA has determined that these revisions would maintain the safety of bulk transport of these materials because the SLP-23 (2011) standard currently incorporated by reference already authorizes larger bulk quantities consistent with the hazardous material offered in accordance with DOT-SP 8723 and has a safety record of use for 10 years.

PHMSA expects the changes proposed by IME in this petition to streamline regulatory requirements without a negative impact on safety. PHMSA quantified the effects of removing the administrative requirements of applying for a special permit and estimates the average annual cost savings to be \$6,120 per year. There are several other effects of this proposal that may result in costs, cost savings, and benefits, but these results are less certain and are described qualitatively. A more detailed discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

PHMSA asserts that the incorporation by reference of SLP-23 (2021) will enhance safety by adopting technological advances and best practices used in the bulk explosives industry. PHMSA proposes to incorporate by reference of SLP-23 (2021), “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging” into 49 CFR 171.7(r)(2) and replace the 2011 edition currently in the HMR. PHMSA also proposes to revise special provision 148 to clearly state that the VPT requirements in SLP-23 (2011) would still apply. PHMSA also proposes to add new special provision TP48 to 49 CFR 172.102(c)(8) to authorize the use of IM 101 and 102 portable tanks for ANEs when transported under SLP-23 (2021). PHMSA proposes to assign TP48 to the



following UN numbers in 49 CFR 172.102 of the HMT: “UN0332, Explosive, blasting, type E,” “UN3375, Ammonium nitrate emulsion,” and “UN3139, Oxidizing liquid, n.o.s., PG II.” Lastly, PHMSA proposes to revise 49 CFR 173.251 to state that this section is not applicable when “UN3375, Ammonium nitrate emulsion” is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).

J. Revision of testing and marking of UN specification packagings

In its petition (P-1732),<sup>26</sup> the Sporting Arms and Ammunition Manufacturers’ Institute, Inc. (SAAMI) proposes that PHMSA amend 49 CFR 178.503(a)(6) by allowing UN performance-oriented boxes (e.g., UN 4A, 4B, or 4N for steel, aluminum, or other metal boxes, respectively) to be marked with the last two digits of the year of testing certification rather than the last two digits for year of manufacture. Additionally, the SAAMI petition proposes to add an additional selective testing variation in 49 CFR 178.601(g) to allow for variation of packagings that include articles containing solid hazardous materials, packed in inner packagings without further testing, subject to certain conditions. SAAMI requests that this variation also allow for an increase in dimensions of the outer packaging of the combination packaging based on the tested design type. Lastly, the SAAMI petition proposes to revise the frequency of periodic retesting for combination packagings in 49 CFR 178.601 from 24 months to 60 months. PHMSA needs more time to evaluate this final proposal and therefore it is not proposing the amendment in this rulemaking. However, PHMSA may consider this proposal in a future rulemaking.

With regard to the marking proposal, the marking requirements in 49 CFR 178.503(a)(6) currently require packages to be marked with the last two digits of the year of manufacture. SAAMI asserts that the year of manufacture is meant to tie the packaging to a specific certification (i.e., tied to design qualification testing and periodic retesting to a UN standard). SAAMI asserts that while the date of manufacture is informative, this degree of specificity is not

---

<sup>26</sup> P-1732 – SAAMI (PHMSA-2019-0069), <https://www.regulations.gov/docket/PHMSA-2019-0069>.

necessary for safety or enforcement purposes. SAAMI adds that because the retesting of the design type occurs every two years,<sup>27</sup> industries incur costs to change the year of manufacture marking on packagings that are still being produced under the same design test. (PHMSA notes that this conclusion is based on the presumption that manufacturers of combination packagings are operating at the minimum test frequency of retesting every 24 months.) SAAMI asserts that allowing marking of the last two digits of the year of packaging certification on packagings is considered an acceptable substitute to the current regulatory requirement in 49 CFR 178.503(a)(6) and eliminates the need to change printing plates annually.

PHMSA conducted a technical review of the proposal to authorize boxes marked with the last two digits of the year of testing certification marked rather than the year of manufacture. PHMSA believes that this proposal will maintain the current safety standard for these packaging types. PHMSA has determined, consistent with SAAMI's petition, that the only likely effect of the proposed revision is that packaging manufacturers that periodically retest packagings less frequently than annually would not need to update printing plates annually, and instead would only need to update plates biennially, resulting in a small reduction in regulatory burden.

With regard to the selective testing variation proposal, 49 CFR 178.601 contains the general requirements for the testing of non-bulk UN performance-oriented packagings and packages. Specifically, 49 CFR 178.601(g) contains packaging variations that allow for the selective testing of packagings that differ only in minor respects from a tested design type. SAAMI proposes in its petition to create an additional packaging variation under 49 CFR 178.601(g) to include small arms ammunition—specifically, “Cartridges for weapons, inert projectile(s) or blank (UN0012 and UN0014); Primers, cap type (UN0044); and Cases, cartridge, empty with primer(UN0055)—packed in inner packages.” Specifically, SAAMI proposes allowing inner packagings of ammunition to be assembled and transported without packaging

---

<sup>27</sup> The periodic retest requirements for combination packagings call for conducting design qualification retesting at least once every 24 months. *See* § 178.601(e).

testing, provided that the outer packaging of a combination package of articles successfully passes the tests in accordance with 49 CFR 178.603 and 178.606. Additionally, the SAAMI petition proposes for the packaging variation to allow for larger packages to use the certification of a smaller tested package.

PHMSA conducted a technical review of the SAAMI proposal for a new selective testing variation to allow for limited testing of combination packagings for small arms ammunition and components. PHMSA concurs with the proposal to allow for a variation in combination packagings used for materials classified as UN0012, UN0014, UN0044, and UN0055 without further testing. PHMSA has determined that allowing for a variation in the packagings used to ship UN0012, UN0014, UN0044, and UN0055 will not lead to a reduction in safety because PHMSA does not expect this minor package variation to affect the performance of the package. PHMSA does not, however, propose to adopt the SAAMI proposal to allow for an increase in external dimensions of the outer package (i.e., allow larger packages) based on the tested design type. This proposal is novel to the extent that no current packaging variation in 49 CFR 178.601(g) of the HMR allows for an increase in size of a packaging from a tested design type and SAAMI did not provide a safety justification to support such a change. Without this additional data, PHMSA cannot make a determination that increasing the size of a package from a tested design type will not lead to a decrease in safety.

PHMSA conducted an economic evaluation of the proposal to amend § 178.503(a)(6) to allow the year of test certification to be marked on specification boxes instead of the month and year of manufacture. For this proposal, PHMSA estimated annualized cost savings of approximately \$150,000. PHMSA also conducted an economic evaluation of the proposal to amend § 178.601(g) to allow specified inner packagings to be assembled and transported without testing under certain conditions. For this proposal, PHMSA estimates annualized cost savings of approximately \$750,000 if this proposal were to be adopted. Together, PHMSA estimates that these two proposals will yield an annualized cost savings of \$900,000. A more detailed

discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to amend §178.503(a)(6) to allow adding the last two digits of the year of certification be marked on type 4 packagings as an alternative to the year of manufacture. In addition, PHMSA proposes a new packaging variation in § 178.601(g)(6) to authorize selective testing of packagings containing “Cartridges for weapons, inert projectile(s) or blank (UN0012 and UN0014), Primers, cap type (UN0044), and Cases, cartridge, empty with primer (UN0055).” Inner packagings intended to contain these materials may be assembled and transported without testing provided that the outer packaging of a combination packaging successfully passes the tests in accordance with 49 CFR 178.603 and 178.606, and the gross mass does not exceed that of the tested type. Further, PHMSA solicits comment on whether this testing variation should be expanded to other types of articles containing solid hazardous materials, such as fireworks. PHMSA asks that comments include the associated cost savings of any such expansion.

K. Authorizing smaller combustible placard on IBCs

In its petition (P-1734),<sup>28</sup> Evonik proposes that PHMSA revise 49 CFR 172.514(c) by adding an option for smaller placards for intermediate bulk containers (IBCs) carrying combustible liquids by adopting the provisions in DOT-SP 16295<sup>29</sup> into the HMR. This would allow shippers to transport IBCs containing combustible liquids (NA1993) bearing a combustible placard sized to be consistent with the label size specifications in 49 CFR 172.407(c). Section 172.407(c) requires diamond shaped labels to be at least 100 mm (3.9 inches) on each side.

The HMR requires placards to be at least 250 mm (9.84 inches) on each side. Section 172.514(c) prescribes the exceptions for placarding bulk packages. Specifically, paragraph (c)(4)

---

<sup>28</sup> P-1734 – Evonik (PHMSA-2019-0089), <https://www.regulations.gov/docket/PHMSA-2019-0089>.

<sup>29</sup> DOT SP-16295, <https://cms7.phmsa.dot.gov/approvals-and-permits/hazmat/file-serve/offer/SP16295.pdf/2018080498/SP16295>.

authorizes IBCs to be labeled in accordance with part 172, subpart E. However, IBCs transporting combustible liquids do not qualify for that exception because there is no authorized label for combustible liquids.

Evonik states in its petition that a smaller-sized combustible placard would allow for more space for proper placarding and marking placement due to the commonly limited space available to display hazard information on the IBC side plates and panels. Moreover, Evonik states that a smaller placard provides a level of safety equivalent to the requirements in 49 CFR 172.514(c)(4), where an IBC is authorized to be labeled instead of placarded (e.g., flammable labels vs. flammable placards), and in 49 CFR 172.406(e)(6), where duplicate labels are not required on two sides or two ends of an IBC with a volume of 1.8 m<sup>3</sup> (64 cubic feet) or less (approximately 478 gallons). Because these exceptions are allowed for hazardous materials considered to pose greater danger than combustible liquids, Evonik asserts the reduction in size for combustible placards will maintain a safe level of hazard communication for transport of combustible liquids in IBCs.

While this proposal is not technical in nature, PHMSA concludes that—from a policy and safety perspective—this amendment does not change the safety requirements for the transportation of an IBC, but will provide greater flexibility by making more space available for other necessary information on the IBC. Additionally, this amendment would not result in any cost to industry or impose any new regulatory burden to industry. There will be a marginal cost savings due to current special permit holders no longer needing to apply to renew their special permits. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise 49 CFR 172.514(c)(4) to allow IBCs containing combustible liquids to be placarded with a combustible placard that meets the label size specifications in § 172.407(c). PHMSA notes that this petition was focused on allowing a smaller placard size for IBCs. Yet, § 172.514(c) authorizes labels—essentially a smaller-sized placard—

instead of placards for other types of bulk packagings (e.g., a portable tank having a capacity of less than 3,785 L (1000 gallons). PHMSA solicits comment on whether this rulemaking should also authorize smaller placards for other bulk packagings containing combustible liquids authorized to use a label instead of a placard, and the associated cost savings of such authorization.

L. Incorporate by reference IME Safety Library Publication 22 (SLP-22)

In its petition (P-1736),<sup>30</sup> IME proposes that PHMSA incorporate by reference IME SLP-22 (2019), “Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials.” The HMR currently incorporates by reference the IME SLP-22 (2007) version in the HMR at 49 CFR 171.7(r)(1).

IME notes that DOT has long accepted the SLP-22 publication and its recommendations for the safe transportation of detonators in a vehicle. SLP-22 (2007) is referenced in 49 CFR 173.63 and 177.835. IME notes that much of the SLP-22 standard has remained virtually unchanged since 1972 and has proven effective for the safe transportation of detonators. None of millions of shipments of detonators and explosives made using SLP-22 have resulted in a mass-detonation. The primary intent of SLP-22 is not to prevent mass detonation, but instead to allow sufficient time in the event of a transportation incident, such as fire, to evacuate bystanders to a safe distance. Testing conducted by IME has shown that transporting detonators in an undamaged box constructed to the standard set forth in SLP-22 will prevent, for 30 minutes or longer, mass detonation.

SLP-22 (2019) reflects necessary changes and improvements to the SLP-22 (2007) edition and includes technical corrections, practical improvements, and deletion of outdated practices.

Specifically, changes to SLP-22 include:

---

<sup>30</sup> P-1736 – IME (PHMSA-2019-0167), <https://www.regulations.gov/docket/PHMSA-2019-0167>.

- Providing clarity on the text “other positions may be acceptable” by specifying alternative placement of SLP-22 packages or containers on a motor vehicle based on vehicle cargo space configuration.
- Consistent with the alternative positions, adding a constraint to limit positions of a container on the vehicle as far as possible from the points on the vehicle that are most susceptible to high temperature fires due to accidents or severe mechanical failures (e.g., the vehicle fuel tank).
- Adding reference to IME SLP-23 for containers mounted on a cargo tank motor vehicle.
- Adding a requirement that structural components (i.e., latches) must be bolted or welded to the steel in the wall of the container or compartment.
- Allowing alternative materials of construction subject to certain performance standards (i.e., constructed of or covered with non-sparking material).
- Adopting several revisions that provide clarity and correct typographical errors.

PHMSA conducted a technical review of each revision included in SLP-22 (2019) and has concluded that these changes will either maintain or enhance the safety of transporting detonators by highway with other explosive materials. PHMSA supports the overall intent to allow more time for evacuation should there be an incident. PHMSA proposes to incorporate by reference SLP-22 (2019). PHMSA has concluded that the specifications proposed in Section C.9 of the document are adequate to provide the flexibility to allow for alternative materials of construction without compromising safety.

PHMSA conducted an economic analysis of the IME proposal and found that the changes made to sections C.1 and C.1.a provide more flexibility for businesses in their placement of SLP-22 boxes while still meeting safety standards. The proposed changes to section C.1.c regarding padlocks could result in annual cost savings of approximately \$2,000, assuming a small percentage of vehicles (0.1 percent) take advantage of the one-time cost savings associated with

purchasing new padlocks. C.9's allowance of alternative materials in the construction of SLP-22 boxes may result in cost savings of approximately \$875,000 per year. These cost savings, however, are contingent on the quantity and type of material substitutions made by SLP-22 box manufacturers, which is uncertain. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for the rulemaking.

Therefore, PHMSA proposes to amend 49 CFR 171.7(r)(1) to reference IME SLP-22 (2019). In addition, PHMSA proposes to make an editorial revision to 49 CFR 171.7(r)(1) by inserting a space between "IME Standard 22," and "IME" in the first line and amend the date to read "June 2019."

M. Definition of a liquid

In its petition (P-1738),<sup>31</sup> COSTHA proposes that PHMSA modify the definition of a liquid in 49 CFR 171.8 to include the test for determining fluidity—ISO 2137:1985 (penetrometer test)—prescribed in section 2.3.4 of Annex A of the ADR. Section 171.8 states that a liquid means a material, other than an elevated temperature material, with a melting point or initial melting point of 20 °C (68 °F) or lower at a standard pressure of 101.3 kPa (14.7 pounds per square inch). A viscous material for which a specific melting point cannot be determined must be subjected to the procedures specified in ASTM D 4359 (1990), "Standard Test Method for Determining Whether a Material is Liquid or Solid." The UN Model Regulations, ICAO Technical Instructions, and IMDG Code all include the penetrometer test as an alternative to performing the ASTM D 4359 test method in determination of whether a material is a liquid.

In addition, COSTHA states that there have been no recorded instances of determination of liquidity using the ADR penetrometer test increasing the risk to safety while in transportation. COSTHA adds that under the current system, a material manufactured outside the United States

---

<sup>31</sup> P-1738 – COSTHA (PHMSA-2019-0233), <https://www.regulations.gov/docket/PHMSA-2019-0233>.



and classified using the penetrometer test may not be reshipped within the United States without first performing the ASTM D 4359 test method. The HMR does not authorize the ADR penetrometer test as a method for determining if a material is a liquid, and thus, any hazard classification based on this result is not valid in the United States. This results in increased cost for shippers to conduct additional testing and creates a barrier to importing materials into the United States.

PHMSA conducted a technical review of the COSTHA proposal to harmonize the HMR definition with international use of the ADR penetrometer test for determination of a liquid. The test proposed, ISO 2137:1985, as identified in the ADR under section 2.3.4, is referenced in the UN Model Regulations Volume 1, 20<sup>th</sup> edition in section 1.2.1, Definitions, Liquid and in the UN Manual of Tests and Criteria 7<sup>th</sup> edition as a footnote reference to UNMR 1.2.1 at the end of 20.4.1.5. PHMSA finds that the ISO test is more empirical in nature than ASTM D 4359 and provides better understanding of the physical properties of the tested material. Therefore, PHMSA believes the adoption of penetrometer test into the HMR will provide a level of safety equal or greater to the currently approved ASTM test method. Lastly, the addition of the penetrometer test into the HMR will allow for more flexibility to offerors by providing an additional option for the testing of liquids. An economic analysis of this petition could not validate the estimates from the petitioner that suggest cost savings from this proposal. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

For the reasons stated in this section, PHMSA proposes to revise the definition of a liquid in 49 CFR 171.8 to reference the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the ADR.

N. Incorporate by reference updated CGA C-7 (2020)

In its petition (P-1744),<sup>32</sup> CGA proposes that PHMSA incorporate by reference the updated Appendix A of CGA publication C-7 (2020), “Guide to Classification and Labeling of Compressed Gases”, Eleventh Edition, into the HMR at 49 CFR 171.7(n)(8). Currently, the HMR incorporates by reference CGA C-7 (2014), “Guide to Classification and Labeling of Compressed Gases,” Tenth Edition. The HMR currently authorizes the marking of a Dewar flask or a cylinder in accordance with CGA C-7 (2014), Appendix A instead of labeling (*see* 49 CFR 172.400a). CGA states that an update is needed to CGA C-7, Tenth Edition (2014) to address changes made to Appendix A in the Eleventh Edition (2020), such as:

- Providing greater flexibility in display of the hazard class by allowing it to be displayed on one or two lines.
- Clarifying that the marking system elements must meet certain minimum size requirements.
- Providing an example of the CGA marking system for multiple hazard diamonds that are overlapped.

CGA C-7 (2020) states the general principles for labels and markings of cylinders and provides recommended minimum requirements for many hazardous gases and selected liquids used in such cylinders.

PHMSA conducted a technical review of this petition, including a review of the revised Appendix A to C-7 (2020), and found that the proposed changes are minor and primarily editorial clarifications. PHMSA concludes that these editorial revisions in Appendix A to CGA C-7 (2020) will not negatively impact hazard communication.

PHMSA conducted an economic review of this petition and found no quantifiable benefits associated with this change. However, the proposed changes found in Appendix A to CGA C-7 (2020) would provide clearer guidance to the regulated community and thus increase

---

<sup>32</sup> P-1744 – CGA (PHMSA-2020-0104), <https://www.regulations.gov/docket/PHMSA-2020-0104>.

compliance. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise 49 CFR 171.7(n)(8) to reference CGA C-7 (2020), “Guide to Classification and Labeling of Compressed Gases”, Eleventh Edition.

O. Incorporate by reference CGA C-27 (2019)

In its petition (P-1746),<sup>33</sup> CGA proposes that PHMSA incorporate by reference CGA C-27 (2019), “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes,” First Edition. PHMSA notes that this publication defines “tube” as a seamless steel pressure vessel with openings at both ends and with a water capacity of 120 L or greater. CGA proposes to revise 49 CFR 180.212(a)(1) to allow for repairs of a seamless steel DOT 3-series cylinder at a repair facility that holds a valid “K” number approval, issued under the provisions in 49 CFR 107.805. Cylinder owners would be permitted to apply to reduce the service pressure of cylinders in accordance with CGA C-27. Approved facilities would then process these applications to determine if a DOT 3-Series cylinder rejected for insufficient minimum wall thickness could be derated from the original marked service pressure.

CGA C-27 provides a standard procedure to derate the service pressure of DOT 3-series seamless steel tubes with local thin areas in the walls of the tube that do not meet the minimum thickness criteria of the specification. Derating is the lowering of the maximum allowable service pressure of a cylinder due to thinning of a cylinder’s walls to extend the life of the cylinder. In accordance with CGA C-27, any tube with a suspect thin area found during AET, UE, or visual inspection must be evaluated in accordance with CGA C-20. If the tube does not meet the minimum thickness requirements in Section 4b of CGA C-27, a cylinder owner may apply to PHMSA to reduce the marked service pressure of the cylinders, in accordance with Section 4c of CGA C-27. The procedure to derate a tube must be performed by a DOT-approved repair

---

<sup>33</sup> P-1746 – CGA (PHMSA-2020-0116), <https://www.regulations.gov/docket/PHMSA-2020-0116>.

facility. CGA C-27 does not apply to tubes that have been condemned from any requalification method. Cylinder repair shops must be approved by PHMSA to have the authority to repair a cylinder. These companies receive a K-number from PHMSA, and the K-number approval indicates whether a company is authorized to perform repairs or rebuilds of cylinders, and in this case, DOT 3-series tubes.

CGA asserts that the incorporation by reference of CGA C-27 will minimize inquiries to PHMSA by standardizing and codifying the existing process under the PHMSA document, “Guidance for Applications to Down-Rate the Service Pressure of DOT Seamless Steel Cylinders (Rev. 3/27/13),”<sup>34</sup> and provide persons seeking to derate a tube with instruction on pertinent information to submit to PHMSA in a logical and consistent manner.

PHMSA conducted a technical review of the proposals in the petition, including a review of CGA C-27, and found that the proposed method for pressure derating of tubes is essentially the same as what is outlined in the PHMSA guidance document. Both documents provide instructions on how persons should conduct an initial inspection using CGA C-6 (2013), “Standard for Visual Inspection of Steel Compressed Gas Cylinders,” to establish that the tube is in good physical, serviceable condition for pressure derating with no rejectable corrosion, pitting, dents, gouges, or other defects. If deemed suitable for pressure derating, the tube should undergo 100 percent ultrasonic testing (UT) to establish a minimum sidewall thickness on which to base the new reduced service pressure. The methodology used in calculation of the new service pressure is the same as the current methodology used to determine the allowable service pressure for DOT 3-series seamless steel cylinders found in the HMR at 49 CFR 178.36 (3A and 3AX), 49 CFR 178.37 (3AA and 3AAX), and 49 CFR 178.38 (3B). The calculations should then be certified by the tube manufacturer, or by the Independent Inspection Agency (IIA) if the tube manufacturer is no longer in service or available. IIAs are approved by the Associate Administrator to perform a review of a company’s inspection or requalification operation. In

---

<sup>34</sup> <https://www.regulations.gov/document/PHMSA-2020-0116-0003>.

summary, the PHMSA technical review found that the procedures in CGA C-27 are equivalent to the procedure established in the PHMSA guidance document for pressure derating of tubes and should have no impact on safety.

PHMSA conducted an economic evaluation of this petition and found that no benefits or additional costs other than the cost to obtain the publication are expected as a result of the proposed changes in this petition. A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to incorporate by reference CGA C-27 “Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes”, First Edition, in 49 CFR 171.7. PHMSA also proposes to add 49 CFR 180.212(a)(4) for instruction on derating of a cylinder reference to CGA C-27.

P. Incorporate by reference CGA C-29 (2019)

In its petition (P-1747),<sup>35</sup> CGA proposes that PHMSA incorporate by reference CGA C-29 (2019), “Standard for Design Requirements for Tube Trailers and Tube Modules,” First Edition, which would supersede CGA TB-25 (2018), “Design Considerations for Tube Trailers.” CGA also proposes conforming revisions to 49 CFR 173.301 to replace references to CGA TB-25 with references to CGA C-29.

CGA C-29 defines basic design requirements for tube trailers and tube modules to maintain structural integrity during normal conditions of handling and transport. A tube trailer or tube module manufactured in accordance with this standard is less likely to have a separation of the tubes from the trailer or bundle or an unintentional release of product when subjected to the multidirectional forces that can occur during a highway collision, including a rollover accident. Under this standard, tube modules must meet the loading and accident protection standards that are applied to tube trailers.

---

<sup>35</sup> P-1747 – CGA (PHMSA-2020-0117), <https://www.regulations.gov/docket/PHMSA-2020-0117>.

In its petition, CGA outlines the changes between the CGA TB-25 (currently incorporated by reference in § 171.7) and CGA C-29. Examples of these revisions include:

- Changing the Technical Bulletin to a CGA Standard.
- Changing the title of the document to “Standard for Design Requirements for Tube Trailers and Tube Modules.”
- Adding a scope section that specifies that CGA C-29 is not applicable to a multiple-element gas container (MEGC) because MEGC design requirements are found in 49 CFR § 178.75.
- Providing several examples of testing and methods that meet the requirement of verifiable performance testing and analytical methods within the basic design requirements section.
- Changing “should” to “shall” in several places within the document to provide a standard that includes enforceable language.
- Referencing CGA C-23, “Standard for Inspection of DOT/TC 3 Series and ISO 11120 Tube Neck Mounting Surfaces,” Second Edition.

CGA developed CGA C-29 to supersede TB-25 and asserts that CGA C-29 provides a more optimal level of safety for the public and a satisfactory performance standard when cylinders are mounted on motor vehicles or in frames for transportation. In addition, CGA asserts that C-29 provides more enforceable language, whereas TB-25 does not (i.e., use of “shall” vs. “should”).

A technical review of the petition and supporting documents found that CGA C-29 is technically accurate, consistent with CGA TB-25, and provides safety improvements for the transport of tube trailers. Additionally, PHMSA concludes that tube trailers or modules manufactured in accordance with CGA C-29 are less likely to have separation of tubes from the trailer or bundle, which could result in the unintentional release of hazardous materials, when subjected to multidirectional forces that can occur in highway collisions, including rollover

accidents. Therefore, PHMSA asserts the incorporation by reference of CGA C-29 will enhance the safe transportation of hazardous materials in tube trailers.

PHMSA conducted an economic evaluation and found that most operators are already following the guidelines in CGA C-29 and thus there are limited quantifiable economic benefits. The largest potential source of benefits from mandatory adoption is enhanced safety through a more standardized qualification and testing regime. Minor economic benefits might also be derived from the editorial and definitional clarifications provided in the updated CGA requirements. Should these changes make requirements for operators clearer and easier to follow, that would support compliance with the regulation. A more detailed discussion of the economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to incorporate by reference CGA C-29 “Standard for Design Requirements for Tube Trailers and Tube Modules”, First Edition, into 49 CFR 171.7 and remove the references to CGA TB-25, “Design Considerations for Tube Trailers.” PHMSA also proposes to revise 49 CFR 173.301(i) to replace references to CGA TB-25 with references to CGA C-29.

Q. Incorporate by reference CGA V-9 (2019)

In its petition (P-1748),<sup>36</sup> CGA proposes that PHMSA incorporate by reference CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Gas Cylinder Valves,” Eighth Edition. The HMR currently references the Seventh Edition of CGA V-9 (2012). The major updates to CGA V-9 (2019) ensure continuity and consistency with the testing requirements of ISO 10297, “Gas cylinder—Cylinder valves—Specification and Type Testing.”

The CGA V-9 (2019) standard covers compressed gas cylinder valve design, selection, manufacture, and use, including performance requirements such as operating temperature limits, pressure ranges, and flow capabilities. The standard also includes requirements for materials,

---

<sup>36</sup> P-1748 – CGA (PHMSA-2020-0124), <https://www.regulations.gov/docket/PHMSA-2020-0124>.

inlet and outlet connections, cleaning, qualification and production testing, maintenance, and reconditioning. In addition, CGA V-9 (2019) includes guidelines and requirements for the design, material selection, testing, and marking of cylinder valve protection caps. Finally, the standard provides a listing of valve types and associated drawings and their application and limitations.

A technical review of CGA V-9 (2019) verified updates and revisions made to CGA V-9 (2012), which is currently incorporated by reference in the HMR. PHMSA found these revisions were primarily editorial in nature, except for the revision to harmonize CGA V-9 (2019) with the testing requirements of ISO 10297. Because PHMSA has already incorporated by reference ISO 10297 in the HMR, there is no technical reason to not incorporate by reference the updated version of CGA V-9 (2019), which references the ISO 10297 standard. In addition, because CGA-V-9 (2019) now references ISO 10297, it will allow greater flexibility in selecting and qualifying valves and thus avoid redundant compliance with both ISO 10297 and CGA V-9 (2019).

PHMSA asserts that this proposal should result in benefits to the industry, as CGA V-9 (2019) allows the use of listed valves in other standards, such as those qualified to ISO 10297, thereby avoiding or minimizing additional qualification costs. Manufacturers and users of compressed gas cylinder valves would no longer need to conduct two different tests to satisfy ISO 10297 (as currently required by the HMR) and CGA V-9 (2019). A more detailed discussion of this economic analysis of this proposal can be found in the PRIA posted to the docket for this rulemaking.

Therefore, PHMSA proposes to revise § 171.7(n)(26) to replace CGA V-9 (2012), “Compressed Gas Association Standard for Compressed Cylinder Valves”, Seventh Edition, with CGA V-9 (2019), “Compressed Gas Association Standard for Compressed Cylinder Valves,” Eighth Edition.



R. Phaseout of hydrofluorocarbons (HFCs)

The Environmental Protection Agency (EPA) published a final rule<sup>37</sup> to issue regulations implementing certain provisions of the American Innovation and Manufacturing (AIM) Act,<sup>38</sup> as enacted on December 27, 2020. One provision of the AIM Act mandates the phasedown of HFCs—a group of chemicals commonly referred to as refrigerants because of their primary use for cooling and refrigeration applications like air conditioning—by at least 85 percent by 2036. HFCs are highly potent greenhouse gases that trap heat in the atmosphere and warm the planet. The Act directs the EPA to implement the phasedown by issuing a fixed quantity of transferrable production and consumption allowances, which producers and importers of hydrofluorocarbons must hold in quantities equal to the number of hydrofluorocarbons they produce or import. For the time period of 2022–2050, the EPA estimates the rulemaking will avoid cumulative emissions of 4,560 million metric tons of exchange value equivalent<sup>39</sup> of HFCs in the United States with a present value of cumulative net benefits of \$272.7 billion.<sup>40</sup>

The EPA final rule implements a two-stage approach that first prohibits additional disposable cylinders—i.e., non-refillables—from being introduced to the market by January 1, 2025, and secondly prohibits sales altogether by January 1, 2027. A primary example of a non-refillable cylinder authorized for transport of HFCs is a DOT 39 cylinder. In the final rule, EPA notes that the AIM Act gives the agency broad authority to implement these prohibitions relating to the sale or distribution, or offer for sale or distribution, of regulated substances that were illegally produced or imported.

In this NPRM, PHMSA proposes to adopt the same prohibition on the filling and transportation of certain HFCs in non-refillable cylinders to align with EPA’s efforts to fulfill the AIM Act mandate and combat climate impacts, and to avoid potential confusion by industry if

---

<sup>37</sup> 86 FR 55116 (Oct. 5, 2021).

<sup>38</sup> <https://www.epa.gov/climate-hfcs-reduction/aim-act>.

<sup>39</sup> EPA uses the term “exchange value equivalent” to provide a common unit of measure between HFCs and the AIM Act defines “exchange value” as the value assigned to a regulated substance (i.e., a regulated HFC).

<sup>40</sup> 86 FR 55116 (Oct. 5, 2021).

PHMSA were to continue to authorize these materials in non-refillable cylinders while prohibited by EPA. Currently in the HMR, the filling of cylinders with liquefied compressed gases such as these HFCs is authorized in § 173.304. To align with the EPA prohibition on the import, filling, and use of non-refillable cylinders as part of the phaseout of HFCs, PHMSA proposes to revise the § 173.304(d) transportation requirements for refrigerant gases. First, PHMSA proposes to move the current paragraph (d) requirements to a new paragraph (d)(1) regarding refrigerant and dispersant gases. Second, PHMSA proposes to create a new paragraph (d)(2) to add a list of HFCs that would no longer be permitted to be filled and transported in non-refillable cylinders. These HFCs include:

<b>Chemical name</b>	<b>Common name</b>
CHF <sub>2</sub> CHF <sub>2</sub>	HFC-134
CH <sub>2</sub> FCF <sub>3</sub>	HFC-134a
CH <sub>2</sub> FCHF <sub>2</sub>	HFC-143
CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-245fa
CF <sub>3</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>3</sub>	HFC-365mfc
CF <sub>3</sub> CHF <sub>2</sub> CF <sub>3</sub>	HFC-227ea
CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub>	HFC-236cb
CHF <sub>2</sub> CHF <sub>2</sub> CF <sub>3</sub>	HFC-236ea
CF <sub>3</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-236fa
CH <sub>2</sub> FCF <sub>2</sub> CHF <sub>2</sub>	HFC-245ca
CF <sub>3</sub> CHFCH <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	HFC-43-10mee
CH <sub>2</sub> F <sub>2</sub>	HFC-32
CHF <sub>2</sub> CF <sub>3</sub>	HFC-125
CH <sub>3</sub> CF <sub>3</sub>	HFC-143a
CH <sub>3</sub> F	HFC-41
CH <sub>2</sub> FCH <sub>2</sub> F	HFC-152
CH <sub>3</sub> CHF <sub>2</sub>	HFC-152a
CHF <sub>3</sub>	HFC-23

Finally, this proposal would phase out the import or domestic filling of a listed HFC in a non-refillable cylinder by January 1, 2025, and would prohibit the offering of HFCs identified in this section in a non-refillable cylinder after January 1, 2027. Lastly, this proposal provides a phaseout exception for small cans (i.e., an aerosol can) containing less than two pounds of a listed HFC that has a self-sealing valve and meets the valve specification requirements in 40 CFR 82.154(c)(2)—i.e., the EPA specifications for self-sealing valves.

S. Emergency Processing of Special Permits

Section 107.117 of the HMR outlines the conditions necessary for applicants who apply for emergency processing of their special permit request. PHMSA occasionally issues a special permit that the Associate Administrator determines is needed to address an imminent safety issue, a threat to national security, or to prevent significant economic loss. (*See* 49 CFR 107.117(a)) However, PHMSA has found it necessary to add an additional criterion due to situations arising that require processing of an emergency special permit but is not clearly outlined in the current 49 CFR 107.117(a). To meet this need, PHMSA is proposing to add a new paragraph (a)(4) to provide clarification that the Associate Administrator may also approve emergency processing of a special permit in support of certain essential governmental functions—both foreign and domestic. For example, a foreign government request for the emergency processing of a special permit application regarding the timely movement of a hazardous material—from or through the United States—in support of law enforcement, life safety (*e.g.*, providing health services items or equipment containing hazardous materials during a pandemic), or judicial activities may qualify under the new paragraph. Separately, to provide clarification of 49 CFR 107.117(a)(2), we are proposing to split the current paragraph (a)(2) into two distinct paragraphs—(a)(2) and (3).

**IV. Section-by-Section Review**

Below is a section-by-section description of the changes being proposed.

A. Section 107.117

49 CFR 107.117 outlines situations when emergency processing of special permits may be appropriate. In this NPRM, PHMSA is proposing to add 49 CFR 107.117(a)(4) to clarify that PHMSA may use emergency processing of special permits in support of essential governmental

functions. Separately, to provide clarification of 49 CFR 107.117(a)(2), we are proposing to split the current clauses into two distinct paragraphs—(a)(2) and (3).

B. Section 171.7

Section 171.7 lists all standards incorporated by reference into the HMR that are not specifically set forth in the regulations. In this NPRM, PHMSA is proposing to incorporate by reference the following publications by CGA, IME, and the UN:

- CGA C-7 (2020), *Guide to Classification and Labeling of Compressed Gases*, (Eleventh Edition), into 49 CFR 172.400a. This publication has been prepared as a guide for the classification and labelling of compressed gases. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-20 (2014), *Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination* (Second Edition), into 49 CFR 180.205. This publication is used for the requalification of seamless cylinders and tubes using UE. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-23 (2018), *Standard for Inspection of DOT/TC 3 Series and ISO 11120, Tube Neck Mounting Surfaces* (Second Edition), into 49 CFR 180.205 and 180.207. This publication applies to the inspection and evaluation of DOT/TC 3-Series and ISO 11120 tubes 12 ft (3.7 m) or longer with an outside diameter greater than or equal to 18 in (457 mm) that are supported by the neck mounting surface. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- CGA C-27 (2019), *Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes* (First Edition), into 49 CFR 180.212. This publication provides a standard procedure to derate the service pressure of DOT 3-series seamless steel tubes with local thin areas (LTA) that do not meet the minimum wall thickness of certain DOT

specifications. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.

- CGA C-29 (2019), *Standard for Design Requirements for Tube Trailers and Tube Modules*, (First Edition), into 49 CFR 173.301. This publication defines basic design requirements for tube trailers and tube modules, manufactured or modified on or after May 11, 2009, to maintain structural integrity during normal conditions of handling and transport. It is general in nature and does not cover all circumstances for each individual cylinder type or lading. Tube trailers manufactured or modified before May 11, 2009, can continue to follow the requirements in TB-25 “Design Considerations for Tube Trailers.” Any modifications to the tube trailer, however, should be done in accordance with CGA C-29.
- CGA V-9 (2019), *Compressed Gas Association Standard for Compressed Gas Cylinder Valves*, (Eight Edition), into 49 CFR 173.301. This publication covers cylinder valve design, manufacture, and use including performance requirements such as operating temperature limits, pressure ranges, and flow capabilities. It is general in nature and does not cover all circumstances for each individual cylinder type or lading.
- SLP-22 (2019), *Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials* into 49 CFR 173.63 and 177.835. This publication outlines the guidelines for the safe transportation of detonators in commercial transportation.
- SLP-23 (2021), *Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging* into 49 CFR 173.66 introductory text and 177.835(d). This publication specifies the requirements for the transportation in bulk packaging of certain Class 1 and Class 5 hazardous materials essential to commercial blasting operations.

- *European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)*, which is already incorporated by reference in § 171.23, into 49 CFR 171.8. The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) outlines regulations concerning the international carriage of dangerous goods by road within the EU and other countries that are party to the agreement. This publication presents the European Agreement, the Protocol Signatures, the annexes, and the amendments. In addition to a new title, the 2020 edition of this document includes amendments necessary to ensure harmonization of ADR with the UN Model Regulations, additional amendments adopted by the Working Group on Tanks as well as amendments proposed by the Working Group on Standards.
- United Nations' *Recommendations on Test Series 8: Applicability of Test Series 8(d)*, June 2019, into 49 CFR 172.102(c)(1), special provision 148. This test series is used to determine if an ammonium nitrate emulsion, suspension or gel, intermediate for blasting explosives (ANE), is insensitive enough for inclusion in Division 5.1, and to evaluate the suitability for transport in tanks.

Additionally, CGA has moved to a new headquarters location. Therefore, we have proposed a revision to 49 CFR 171.7(n) accordingly.

#### C. Section 171.8

Section 171.8 defines terms used throughout the HMR that have broad or multi-modal applicability. PHMSA proposes to modify the definition of *liquid* in § 171.8 to include the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the ADR as an alternative method for determining if a material is a liquid.

D. Section 172.101

The HMT is contained in §172.101. The HMT lists alphabetically, by proper shipping name, those materials that have been designated hazardous materials for the purpose of transportation. It provides information used on shipping papers, package marking, and labeling, as well as other pertinent shipping information for hazardous materials. PHMSA proposes to amend the HMT by referencing special provision TP48 in Column 7 of the HMT for the following HMT entries: “UN0332, Explosive, Blasting, type E”, “UN3375, Ammonium nitrate emulsion”, and “UN3139, Oxidizing liquid n.o.s. (PG II)”.

E. Section 172.102

Section 172.102 lists special provisions applicable to the transportation of specific hazardous materials. Special provisions contain packaging requirements, prohibitions, and exceptions applicable to quantities or forms of hazardous materials. PHMSA proposes to add a new special provision “TP48” to allow the use of IM 101 and 102 portable tanks when transported in accordance with SLP-23. In addition, PHMSA is proposing to revise special provision “148” to require materials assigned this provision to be subject to the Vented Pipe Test (VPT). This ensures continued performance of VPT requirements in the absence of required use of the test in the proposed update of the incorporation by reference of IME SLP-23.

F. Section 172.514

Section 172.514 prescribes the placarding requirements for bulk packagings. PHMSA proposes to revise 49 CFR 172.514(c)(4) to allow an option to use a placard that meets the label specification size requirements in 49 CFR 172.407(c) for combustible liquids transported in IBCs.

G. Section 173.4b

Section 173.4b prescribes exceptions for transporting certain hazardous materials in *de minimis* quantities. PHMSA proposes to revise paragraph (a) to include Division 6.1, PG I materials (no inhalation hazard) in the list of materials authorized for this exception.

H. Section 173.115

Section 173.115 prescribes definitions for Class 2, Divisions 2.1, 2.2, and 2.3 hazardous materials. PHMSA proposes to revise 49 CFR 173.115(e) to state that gas mixtures with component(s) that are liquefied gases may be described using the appropriate hazardous materials description of a non-liquefied compressed gas in the HMT at 49 CFR 172.101 when the partial pressure(s) of the liquefied component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at 20°C.

I. Section 173.185

Section 173.185 prescribes the requirements for packaging and transporting lithium cells and batteries. PHMSA proposes to revise paragraph (c)(3) to clarify that lithium button cell batteries installed in equipment are not subject to any per package or consignment limitations.

J. Section 173.251

Section 173.251 outlines the bulk packaging requirements for ammonium nitrate emulsion, suspension, or gel. PHMSA proposes to revise 49 CFR 173.251 to state that this section is not applicable when “UN3375, Ammonium nitrate emulsion” is transported in IM 101 or 102 portable tanks in accordance with SLP-23 (2021).



K. Section 173.301

Section 173.301 outlines the general requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles, and spherical pressure vessels. PHMSA proposes to revise 49 CFR 173.301 to replace references to CGA TB-25 with references to CGA C-29.

L. Section 173.302a

Section 173.302a specifies the additional requirements for shipment of non-liquefied (permanent) compressed gases in specification cylinders. PHMSA proposes to revise paragraph (c) by redesignating 49 CFR 173.302a(c)(3)(i) and (ii) as 49 CFR 173.302a(c)(4) and (5) to properly reflect that the safety provisions currently in 49 CFR 173.302a(c)(3)(i) and (ii) are independent material construction requirements under paragraph (c). PHMSA also proposes to add paragraph (c)(6) to require that cylinders be equipped with pressure relief devices sized and selected as to type, location, and quantity, and tested in accordance with CGA S-1.1 (previously in paragraph (c)(4)). Lastly, PHMSA proposes to add paragraph (c)(7) to require a plus sign (+) be added following the test date marking on the cylinder to indicate compliance with paragraph (c) of this section.

M. Section 173.302b

Section 173.302b describes the additional requirements for shipment of non-liquefied (permanent) compressed gases in UN pressure receptacles. PHMSA proposes to revise this section by adding a new paragraph (f) to specify packaging restrictions for transporting compressed natural gas and methane in UN seamless steel pressure receptacles. For methane and natural gas with a methane content of 98 percent or greater, the maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 1100 MPa (159,542 psi), and the contents must be free of corroding components. For natural gas with methane content of less than 98

percent, the maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 950 MPa (137,750 psi). Additionally, each discharge end of a UN refillable seamless steel tube must be equipped with an internal drain tube, and the moisture content and concentration of the corroding components must conform to the requirements in § 173.301b(a)(2).

N. Section 173.304

Section 173.304 contains the requirements for the filling of cylinders with liquefied compressed gases. Paragraph (d) specifies authorized cylinders for the transportation of refrigerant and dispersant gases. PHMSA proposes to revise this paragraph by adding a list of the HFCs that are being phased out for use and transportation to align with the EPA implementation of the AIM Act. Additionally, PHMSA proposes language to outline the phaseout dates and exceptions for the transportation of HFCs listed in this section.

O. Section 178.503

Section 178.503 prescribes the requirements for the marking of non-bulk performance-oriented packagings. PHMSA proposes to revise 49 CFR 178.503(a)(6) to allow 4-series boxes to be marked with the last two digits of the year of certification in lieu of the year of manufacture as currently required in the HMR.

P. Section 178.601

Section 178.601 prescribes the general requirements for the testing of non-bulk performance-oriented packagings and packages. PHMSA proposes to redesignate paragraphs (g)(6) through (8) as paragraphs (g)(7) through (9) and add new paragraph (g)(6) to allow packages tested with articles containing solid hazardous materials without intermediate packaging(s) to be assembled with any intermediate packaging(s) without further testing.

Moreover, PHMSA is revising the redesignated paragraph (g)(8) approval provision to include new paragraph (g)(6), such that paragraphs (g)(1) through (7) are referenced in the revised paragraph (g)(8).

Q. Section 180.205

Section 180.205 prescribes the general requirements for requalification of specification cylinders. PHMSA proposes to revise this section to incorporate provisions consistent with CGA C-20-2014, “Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination” (Second Edition), which allow for the use of UE for cylinder requalification. PHMSA proposes to revise paragraphs (e)(2) and (f) to specify that a cylinder requalified using UE must be visually inspected in accordance with paragraph (e)(1). Additionally, PHMSA proposes to add a new paragraph (h) to specify that requalification using UE must be done in accordance with CGA C-20 and by a facility approved by PHMSA for performing UE operations. PHMSA proposes revisions to paragraphs (i) and (j) to specify the rejection requirements for a cylinder that fails requalification tests.

PHMSA also proposes to add § 180.205(c)(5). This paragraph will specify that a DOT 3-series specification cylinder that is 12 feet or longer with an outside diameter greater than or equal to 18 inches and supported by the neck mounting surface during transportation in commerce must be inspected at least every 10 years in accordance with CGA C-23. Lastly, PHMSA proposes to add paragraph (d)(5) to specify the conditions for removal and examination of cylinders in accordance with CGA C-23.

R. Section 180.207

Section 180.207 prescribes the requirements for the requalification of UN pressure receptacles. PHMSA proposes to revise 49 CFR 180.207(d)(1) to require that each seamless steel UN pressure receptacle that is 12 ft or longer with an outside diameter greater than or equal to 18

in supported by the neck mounting surface during transportation in commerce be inspected at least every 10 years in accordance with CGA C-23. In addition, PHMSA proposes to specify conditions for removal and examination of the cylinder in accordance with CGA C-23.

S. Section 180.209

Section 180.209 describes the requalification requirements for specification cylinders. PHMSA proposes an editorial revision to paragraphs (d) and (m) to reference 49 CFR 180.205(j) instead of 49 CFR 180.205(i).

T. Section 180.212

Section 180.212 specifies the requirements for the repair of seamless DOT 3 -series specification cylinders and seamless UN pressure receptacles. PHMSA is proposing to add 49 CFR 180.212(a)(4) to allow derating the service pressure of DOT 3-series seamless steel tubes. PHMSA also proposes to revise 49 CFR 180.212(b)(2) to: (1) allow, as a repair, the external threading of a DOT 3-series cylinder or a seamless UN pressure receptacle manufactured without external threads; and (2) not limit external rethreading to UN pressure receptacles mounted in a MEGC.

**V. Regulatory Analyses and Notices**

A. *Statutory/Legal Authority for This Rulemaking*

This rulemaking is published under the authority of Federal Hazardous Materials Transportation Law (Federal Hazmat Law; 49 U.S.C. 5101 *et seq.*), which authorizes the Secretary of Transportation to “prescribe regulations for the safe transportation, including security, of hazardous materials in intrastate, interstate, and foreign commerce.” The Secretary has delegated the authority granted in the Federal Hazmat Law to the PHMSA Administrator at

49 CFR 1.97. This rulemaking proposes to amend several sections of the HMR in response to 18 petitions for rulemaking received from the regulated community.

*B. Executive Order 12866 and DOT Regulatory Policies and Procedures*

Background

Executive Order 12866 (“Regulatory Planning and Review”) requires that agencies “should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating.” Agencies should consider quantifiable measures and qualitative measures of costs and benefits that are difficult to quantify. Further, Executive Order 12866 recommends that agencies maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach. Similarly, DOT Order 2100.6A (“Rulemaking and Guidance Procedures”) requires that regulations issued by PHMSA, and other DOT Operating Administrations should consider an assessment of the potential benefits, costs, and other important impacts of the proposed action. Also, they should quantify (to the extent practicable) the benefits, costs, and any significant distributional impacts, including any environmental impacts.

PHMSA is responding to 18 petitions that have been submitted by the public in accordance with the Administrative Procedure Act (5 U.S.C. 553(e)) and PHMSA’s rulemaking procedure regulations (49 CFR 106.95 and 106.100). Overall, this proposed rule would maintain the continued safe transportation of hazardous materials while producing a net cost savings. PHMSA’s findings are summarized here and described in further detail in the preliminary Regulatory Impact Analysis (PRIA), which can be found in the regulatory docket (Docket ID: PHMSA-2020-0102) at [www.regulations.gov](http://www.regulations.gov).

Summary of Findings

PHMSA estimates a present value of quantified net cost savings of approximately \$15.18 million over a perpetual time horizon and \$1.22 million annualized at a 7 percent discount rate.

These estimates do not include non-monetized and qualitative cost/cost savings discussed in the PRIA.

PHMSA's cost savings analysis relies on the monetization of impacts for seven petitions included in this rulemaking. All these petitions have annualized cost savings. The following table presents a summary of the seven petitions that would have monetized impacts upon codification and contribute to PHMSA's estimation of quantified net cost savings.

Table 1: Summary of Cost/Cost Savings of Petitions for Regulatory Reform

		<b>All Figures in \$ USD. "X" indicates insignificant cost/savings</b>			
<b>Petition Number</b>	<b>Rule Provision</b>	<b>Significant Costs</b>	<b>One-Time Cost Savings</b>	<b>Significant Benefits</b>	<b>Annual Cost Savings</b>
P-1718	49 CFR 173.4b	X	X	X	162,000
P-1727	49 CFR 180.205	500	X	X	28,000
P-1729	49 CFR 171.7	115,239	X	129,480	X
P-1731	49 CFR 171.7(r)(2)	X	X	X	6,120
P-1732	49 CFR 178.503(a)(6)	X	X	X	150,000
P-1734	49 CFR 172.514(c)(4)	X	X	X	770
P-1736	49 CFR 171.7(r)(1)	X	X	X	876,000
<b>Total (\$USD)</b>		<b>115,739</b>	<b>X</b>	<b>129,480</b>	<b>1,222,890</b>
<b>Net Present Value of Total Net Savings (One-Time Benefits - One-Time Costs + Future Annualized Net Benefit at 7 percent Discount)</b>					<b>\$15,188,633</b>

In addition to these seven items, PHMSA described an additional 11 items that may streamline regulatory compliance. While information gaps prevent quantification of cost savings for these items, PHMSA has determined that they provide relief from unnecessary requirements or provide additional flexibility without compromising safety.

### Conclusion

This NPRM is not considered a significant regulatory action within the meaning of Executive Order 12866 (EO 12866) and DOT policies and procedures. (See DOT Order

2100.6A.<sup>41</sup>) The economic effects of this regulatory action would not have an effect on the economy that exceeds the \$100 million annual threshold defined by EO 12866, and that the regulatory action is not otherwise significant. PHMSA estimates a present value of quantified net cost savings of approximately \$15.18 million over a perpetual time horizon and \$1.22 million annualized at a 7 percent discount rate. Please see the PRIA in the regulatory docket for additional detail and a description of PHMSA's methods and calculations.

### *C. Executive Order 13132*

This rulemaking was analyzed in accordance with the principles and criteria contained in Executive Order 13132 ("Federalism") and the presidential memorandum ("Preemption") published in the *Federal Register* on May 22, 2009 (74 FR 24693). Executive Order 13132 requires agencies to assure meaningful and timely input by state and local officials in the development of regulatory policies that may have "substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government." This rulemaking does not propose any regulation that has substantial direct effects on the states, the relationship between the National Government and the states, or the distribution of power and responsibilities among the various levels of government. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

Federal Hazmat Law contains a general preemption provision (49 U.S.C. 5125(a)) in the event compliance with a state, local, or Indian tribe requirement is not possible or presents an obstacle to compliance. Additionally, Federal Hazmat Law contains an express preemption provision (49 U.S.C. 5125(b)) that preempts state, local, and Indian tribal requirements on:

---

<sup>41</sup> DOT Order 2100.6A "Rulemaking and Guidance Procedures" (June 7, 2021) at: <https://www.transportation.gov/sites/dot.gov/files/2021-06/DOT-2100.6A-Rulemaking-and-Guidance-%28003%29.pdf>.

- (1) The designation, description, and classification of hazardous materials.
- (2) The packing, repacking, handling, labeling, marking, and placarding of hazardous materials.
- (3) The preparation, execution, and use of shipping documents related to hazardous materials and requirements related to the number, contents, and placement of those documents.
- (4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material.
- (5) The design, manufacture, fabrication, marking, maintenance, recondition, repair, or testing of a packaging or container represented, marked, certified, or sold as qualified for use in transporting hazardous material.

This proposed rule addresses covered subject items above and preempts state, local, and Indian tribe requirements not meeting the “substantively the same” standard. DOT has determined that this proposed rule would provide cost savings and regulatory flexibility to the regulated community without compromising safety. This rulemaking proposes to address 18 petitions for rulemaking submitted by the regulated community. PHMSA invites those with an interest in the issues presented to comment on the effect that the adoption of specific proposals may have on state or local governments.

*D. Executive Order 13175*

This rulemaking was analyzed in accordance with the principles and criteria contained in Executive Order 13175 (“Consultation and Coordination with Indian Tribal Governments”). Executive Order 13175 requires agencies to assure meaningful and timely input from Indian tribal government representatives in the development of rules that significantly or uniquely affect tribal communities by imposing “substantial direct compliance costs” or “substantial direct effects” on such communities or the relationship and distribution of power between the Federal Government and Indian tribes. PHMSA has determined that this rulemaking does not have



substantial tribal implications. Therefore, the funding and consultation requirements of Executive Order 13175 do not apply.

However, we invite Indian tribal governments to provide comments on the costs and effects that this NPRM could potentially have on tribal communities.

*E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies*

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Flexibility Fairness Act of 1996, requires Federal regulatory agencies to prepare an Initial Regulatory Flexibility Analysis (IRFA) for any NPRM subject to notice-and-comment rulemaking under the Administrative Procedure Act, unless the agency head certifies that the rule would not have a significant economic impact on a substantial number of small entities. The small entities that could be impacted by this proposal include all small entities engaged in the shipment of hazardous materials. PHMSA expects this proposed rule to facilitate new technologies or other changes that provide safety equivalence at lower cost, streamline or reduce recordkeeping and other paperwork and reporting requirements, and address other changes to reduce the regulatory burden of the HMR. PHMSA has individually evaluated each regulatory change contained in this rulemaking using available information and certifies that none of the proposed changes will have a significant economic impact on a substantial number of small businesses. PHMSA is proposing some new requirements in this NPRM but does not expect these requirements to have a significant impact.

These new requirements include:

1. P-1714 – The proposal adds a new packaging restriction for CNG and methane in seamless steel pressure receptacles. While this is a new requirement under the HMR, CGA stated in its petition that market participants already follow the proposed practices for UN/ISO cylinders. PHMSA, whose subject matter experts participate in the CGA membership meetings

and conferences, has spoken with CGA members and corroborated this assertion; therefore, it does not anticipate that the proposed changes will have an impact on small businesses.

2. P-1727 – This petition incorporates by reference CGA C-20 (2014), “Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition.” As part of the IBR of this new document, cylinder requalifiers must stamp the cylinder “CONDEMNED” and affix a readily visible label on the cylinder stating: “UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION.”

However, PHMSA asserts there will be an overall positive impact on small business for three reasons. Firstly, most large and small affected entities are members of the CGA, allowing them free access to updated CGA reference materials. Secondly, substantially all affected entities already possess cylinder stamping equipment required to implement this regulation and stamping itself takes very little time. Thirdly, small businesses are expected to benefit from this change because small businesses are currently disproportionately burdened by the various special permit requirements that this stamping substitutes for. The time to stamp the cylinders is minimal, and overall, there will be positive impact on small businesses due to no longer needing to apply for a special permit.

3. Phaseout of HFCs—This rulemaking harmonizes with the EPA phaseout of the use of non-refillable cylinders for the transportation of GHGs. While this revision does impose a cost to industry, this cost has already been accounted for in the EPA final rule. Therefore, the proposed revisions in this NPRM do not impose any additional new cost on industry.

The remainder of the proposals in this NPRM are expected to result in cost savings/streamline regulatory requirements without impacting safety. As such, PHMSA’s assessment of non-significant impact on small businesses can be found under the costs and benefits sections found within the PRIA.

*F. Paperwork Reduction Act*

This NPRM does not impose new information collection requirements. PHMSA currently has an approved information collection under OMB Control No. 2137-0051, entitled “Rulemaking, Special Permits, and Preemption Requirements,” expiring on November 30, 2024. This rulemaking eliminates the need for persons to renew a special permit, resulting in a decrease in burden. PHMSA estimates the reduction in information collection burden as follows:

*OMB Control No. 2137-0051: Rulemaking, Special Permits, and Preemption Requirements*

*Decrease in Annual Number of Respondents: 139*

*Decrease in Annual Responses: 139*

*Decrease in Annual Burden Hours: 208.5*

*Decrease in Annual Burden Cost: \$0*

PHMSA specifically requests comments on the information collection and recordkeeping burdens associated with developing, implementing, and maintaining these requirements for approval under this NPRM. Address written comments to the Dockets Unit as identified in the ADDRESSES section of this NPRM. PHMSA must receive comments regarding information collection burdens prior to the close of the comment period identified in the DATES section of this NPRM. Notwithstanding any other provision of law, no person is required to respond to a collection of information unless such collection displays a valid Office of Management and Budget (OMB) control number.

Please direct your requests for a copy of this information collection to Steven Andrews, Office of Hazardous Materials Standards (PHH-12), Pipeline and Hazardous Materials Safety Administration, 1200 New Jersey Avenue SE., 2nd Floor, Washington, DC, 20590-0001.

*G. Unfunded Mandates Reform Act*

The Unfunded Mandates Reform Act of 1995 (UMRA; 2 U.S.C. 1501 et seq.) requires agencies to assess the effects of Federal regulatory actions on state, local, and tribal governments, and the private sector. For any NPRM or final rule that includes a Federal mandate that may result in the expenditure by state, local, and tribal governments, or by the private sector of \$100 million or more in 1996 dollars in any given year, the agency must prepare, amongst other things, a written statement that qualitatively and quantitatively assesses the costs and benefits of the Federal mandate.

As explained in the PRIA, available for review in the docket, this proposed rulemaking does not impose unfunded mandates under the UMRA. It does not result in costs of \$100 million or more in 1996 dollars to either state, local, or tribal governments, or to the private sector, in any one year. Therefore, the analytical requirements of UMRA do not apply. A copy of the PRIA is available for review in the docket.

*H. Environmental Assessment*

The National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) requires that Federal agencies analyze proposed actions to determine whether the action would have a significant impact on the human environment. The Council on Environmental Quality implementing regulations (40 CFR parts 1500 through 1508) requires Federal agencies to conduct an environmental review considering (1) the need for the action, (2) alternatives to the action, (3) probable environmental impacts of the action and alternatives, and (4) the agencies and persons consulted during the consideration process. DOT Order 5610.1C (“Procedures for Considering Environmental Impacts”) establishes departmental procedures for evaluation of environmental impacts under NEPA and its implementing regulations.

1. PURPOSE AND NEED

In response to petitions for rulemaking submitted by the regulated community, PHMSA proposes to amend the HMR to update, clarify, or streamline various regulatory requirements. Specifically, PHMSA proposes amendments that include—but are not limited to—the following: incorporating by reference (IBR) multiple publications from CGA, IME, and the UN; allowing for greater flexibility of packaging options in the transportation of compressed natural gas in cylinders; streamlining the approval application process for the repair of specific DOT specification cylinders; providing greater clarity regarding the filling requirements for certain cylinders used to transport hydrogen and hydrogen mixtures; streamlining hazard communication by allowing marking exceptions under certain conditions during the transportation of lithium button cell batteries; and modifying the definition of liquid to include the test for determining fluidity (penetrometer test) prescribed in the ADR.

These amendments are intended to promote safety, provide clarity and streamline regulatory requirements. The proposed changes were identified in response to petitions from stakeholders affected by the HMR. These proposed changes would clarify the HMR and enhance safety, while offering some net economic benefits.

This action: (1) fulfills our statutory directive to promote transportation safety; (2) fulfills our statutory directive under the Administrative Procedure Act that requires Federal agencies to give interested persons the right to petition an agency to issue, amend, or repeal a rule (5 U.S.C. 553(e)); (3) supports governmental efforts to eliminate unnecessary burdens on the regulated community; (4) addresses safety concerns raised by petitioners and removes identified regulatory ambiguity; and (5) simplifies and clarifies the regulations to promote understanding and compliance.

These regulatory revisions would offer more efficient and effective ways of achieving the PHMSA goal of safe and secure transportation of hazardous materials in commerce, protecting both people and the environment.

## 2. ALTERNATIVES

In proposing this rulemaking, PHMSA is considering the following alternatives:

No Action Alternative: If PHMSA were to select the No Action Alternative, current regulations would remain in place and no provisions would be amended or added.

Proposed Action Alternative: This alternative is the current proposal as it appears in this NPRM, applying to transport of hazardous materials by various transport modes (highway, rail, vessel and aircraft). The proposed amendments included in this alternative are more fully discussed in the preamble and regulatory text sections of this NPRM.

## 3. ANALYSIS OF ENVIRONMENTAL IMPACTS

### No Action Alternative

If PHMSA were to select the No Action Alternative, current regulations would remain in place and no new provisions would be added. However, efficiencies gained through the proposals, which include harmonization in updates to transport standards, lists of regulated substances, definitions, packagings, markings requirements, shipper requirements, and modal requirements, would not be realized. Foregone efficiencies in the No Action Alternative also include freeing up limited resources to concentrate on hazardous materials transportation issues of potentially much greater environmental impact. Not adopting the proposed environmental and safety requirements in the NPRM under the “No Action Alternative” would result in a lost opportunity for reducing negative environmental and safety-related impacts. Greenhouse gas emissions would remain the same under the No Action Alternative. However, PHMSA expects that the No Action Alternative could have a modest negative impact on GHG emissions.

PHMSA expects the provisions for the transportation of compressed natural gas/methane in UN pressure receptacles to have a minimal positive effect on greenhouse gas emissions. This would result from stricter packaging restrictions that should result in fewer failures of these packages

resulting in fewer releases of materials into the environment. Therefore, by choosing the No Action Alternative, a potential reduction in GHG emissions would not be achieved.

#### Proposed Action Alternative

When developing potential regulatory requirements, PHMSA evaluates those requirements to consider the environmental impact of each amendment. Specifically, PHMSA evaluates the risk of release and resulting environmental impact; the risk to human safety, including any risk to first responders; the longevity of the packaging; and if the proposed regulation would be carried out in a defined geographic area using specific resources, especially any sensitive areas and how they could be impacted by any proposed regulations. The regulatory changes proposed in this rulemaking have been determined to be clarification, technology/design updates, harmonization, regulatory flexibility, standard incorporation, or editorial in nature. As such, these amendments have little or no impact on the risk of release and resulting environmental impact, human safety, or longevity of the packaging. None of these amendments would be carried out in a defined geographic area because this is a nationwide rulemaking.

The “Proposed Action Alternative” encompasses enhanced and clarified regulatory requirements, which would result in increased compliance and fewer negative environmental and safety impacts. This environmental assessment incorporates the safety analyses in the preamble sections of this NPRM. The table and list below summarize the possible environmental benefits, greenhouse gas emissions, and any potential negative impacts for the amendments proposed in the NPRM.

<b>Summary of Probable Environmental Impacts by Amendments</b>			
<b>Proposed Amendment(s) to HMR (lettered as above herein)</b>	<b>Type of Amendment(s)</b>	<b>Probable Environmental Impact(s) Anticipated</b>	<b>Greenhouse Gas Emissions</b>
1. P-1714 - Transportation of Compressed Natural Gas / Methane in UN Pressure Receptacles	Regulatory Flexibility	Minimal positive impacts	Minimal positive impacts

2. P-1716 - Threading and repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles	Regulatory Flexibility	No impacts	No impacts
3. P-1717/P-1725 - Clarification of the requirements for non-liquefied compressed gases.	Regulatory Flexibility	No impacts	No impacts
4. P-1718 - De minimus quantities of poisonous materials	Regulatory Flexibility – Harmonization	No impacts	No impacts
5. P-1736 - Clarification of the marking requirements for button cell lithium batteries contained in equipment	Regulatory Flexibility	No impacts	No impacts
6. P-1727 - IBR of CGA C-20 (2014)	Standard Incorporation	No impacts	No impacts
7. P-1728 - Gas Mixtures Containing Components Defined as Liquefied Gases	Regulatory Flexibility	No impacts	No impacts
8. P-1729 - Incorporation by reference of CGA C-23 (2018)	Standard Incorporation	Minimal positive impacts	No impacts
9. P-1731 - IBR of IME's Safety Library Publication 23 (SLP-23)	Standard Incorporation	No impacts	No impacts
10. P-1732 - Revision of testing and marking of UN specification packagings	Regulatory Flexibility	No impacts	No impacts
11. P-1734 - Authorizing smaller-sized combustible placard on IBCs	Regulatory Flexibility	No impacts	No impacts
12. P1736 - IBR of IME Safety Library Publication 22 (SLP-22)	Standard Incorporation	No impacts	No impacts
13. P-1738 – Definition of a Liquid	Regulatory Flexibility – Harmonization	No impacts	No impacts
14. P-1744 - Incorporate by reference updated Appendix A to CGA C-7 (2020)	Standard Incorporation	No impacts	No impacts
15. P-1746 - IBR of CGA C-27 (2019)	Standard Incorporation	No impacts	No impacts
16. P-1747 - IBR of CGA C-29 (2019)	Standard Incorporation	Minimal positive impacts	No impacts
17. P-1748 - IBR of CGA V-9 (2019)	Standard Incorporation	No impacts	No impacts

1. P-1714 – PHMSA proposes implementing packaging restrictions for the transportation of CNG and methane in UN seamless steel pressure receptacles with a tensile strength greater than 950 MPa. As discussed in Sections III and IV of this proposed rule, PHMSA expects that proposed packaging restrictions should result in fewer failures of these packages resulting in fewer releases of materials into the environment. Additionally, because this proposed revision



involves the transportation of GHGs, PHMSA expects that this proposed revision may have a minimal effect on the reduction of GHGs emissions.

2. P-1716 – PHMSA proposes revising the requirements for repairing seamless DOT 3-series specification cylinders and seamless UN pressure receptacles manufactured without external threads and authorizing the performance of this work without requiring prior approval from PHMSA. This proposal provides regulatory flexibility while maintaining safety. As discussed in Sections III and IV of this proposed rule, PHMSA has determined that this is an improvement over the previous method of using setscrews to secure the tubes, which resulted in indentations being carved into the tube necks as the tube jostled during transport. Because this proposal should lower the risk of an incident, since this package is expected to increase safety, the proposal may result in positive environmental impacts due less risk of an accident in transportation. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

3. P-1717/P-1725 – PHMSA proposes to amend 49 CFR 173.302a(c) of the HMR for the special filling limits for DOT specification 3A, 3AX, 3AA, and 3AAX cylinders containing Division 2.1 (flammable) gases. As discussed in Sections III and IV of this proposed rule, these amendments would not represent any incremental, quantifiable safety effects because PHMSA already authorizes the transportation in commerce of hydrogen and mixtures of hydrogen with helium, argon, or nitrogen in certain cylinders filled to more than 10 percent of their marked service pressures. Therefore, PHMSA does not expect this proposal to have any impacts on the environment. Similarly, PHMSA does not expect any effects on GHG emissions.

4. P-1718 – PHMSA proposes to amend 49 CFR 173.4b to harmonize the *de minimis* exceptions for Division 6.1, PG I (no inhalation hazard) materials with international regulations. The release of Division 6.1, PG I materials, including toxic substances, poisons, and irritating material, can have a negative effect on human health and the environment due to toxicity levels of the material. However, as discussed in Sections III and IV of this proposed rule, because the

proposed revision would authorize an existing exception for *de minimis* quantities of additional materials with appropriate safeguards, PHMSA does not expect any significant environmental impacts. Similarly, PHMSA does not expect any effects on GHG emissions.

5. P-1726 – PHMSA proposes to revise 49 CFR 173.185(c)(3) to clarify that lithium button cell batteries installed in equipment are excepted from the marking requirement and not subject to the quantity per package or per consignment limitation. As discussed in Sections III and IV of this proposed rule, because this is not a new requirement and simply clarifies the current requirements in the HMR, PHMSA does not expect any environmental impacts. Similarly, PHMSA does not expect this revision to result in any change in GHG emissions.

6. P-1727 – PHMSA proposes to IBR CGA C-20 (2014), “Requalification Standard for Metallic, DOT and TC 3-Series Gas Cylinders and Tubes Using Ultrasonic Examination, Second Edition.” CGA C-20 provides technical specification for the ultrasonic examination of cylinders. As discussed in Sections III and IV of this proposed rule, PHMSA expects that the use of ultrasonic examination will provide a level of safety at least equivalent to what is currently allowed under the HMR. PHMSA already allows for the ultrasonic examination of certain cylinders (see 49 CFR 180.212 for example). Additionally, 49 CFR 180.205(f) will no longer require internal visual inspection for these cylinders once they have undergone ultrasonic examination, as these actions would be duplicative. PHMSA does not expect the incorporation by reference of CGC C-20 to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

7. P-1728 – PHMSA proposes to authorize an alternative description of gas mixtures containing components defined as liquefied gases. This proposal helps clarify confusion among stakeholders when the content of a cylinder is described as a liquefied compressed gas that resembles a non-liquefied compressed gas. As discussed in Sections III and IV of this proposed rule, PHMSA has determined that the proposed change is safety neutral or slightly improves safety and will provide regulatory flexibility to the regulated community without a reduction in

safety. For these reasons, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

8. P-1729 – PHMSA proposes to IBR CGA C-23 (2018), “Standard for Inspection of DOT/TC 3 series and ISO 11120 Tube Neck Mounting Surfaces, Second Edition” into the HMR at 49 CFR 171.7. As discussed in Sections III and IV of this proposed rule, CGA C-23 provides an inspection standard that PHMSA expects will reduce the likelihood of a release from a DOT/TC 3 series cylinders. Thus, PHMSA expects this proposal to have a minimal positive environmental impact. PHMSA does not expect this revision to result in any increase to GHG emissions.

9. P-1731 – PHMSA proposes to IBR an updated version of IME SLP-23 (2021) titled, “Recommendations for the Transportation of Explosives, Division 1.5; Ammonium Nitrate Emulsions, Division 5.1; and Combustible Liquids in Bulk Packaging.” As discussed in Sections III and IV of this proposed rule, this updates a previously approved version of SLP-23 and provides necessary technical updates and regulatory flexibility. As part of the updated SLP-23, IME included packages designed for the safe transportation of Ammonium Nitrate Emulsions. As part of the review of the IME proposals, PHMSA determined these packages were adequate for the safe transportation of Ammonium Nitrate Emulsions. Thus, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

10. P-1732 – PHMSA proposes to amend 49 CFR 178.503(a)(6) by allowing the last two digits of the year of certification to be marked on a type 4 packagings, rather than the last two digits of the year of manufacture. As discussed in Sections III and IV of this proposed rule, PHMSA has determined that the only effect of the proposed revision is that package manufacturers would not need to update printing plates annually. Instead, they would only need to update plates biennially, resulting in a small reduction in regulatory burden. PHMSA expects

that this proposal will provide regulatory flexibility to the regulated community without a reduction in safety. For these reasons, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

11. P-1734 – PHMSA proposes to revise 49 CFR 172.514(c) by incorporating the provisions in DOT SP-16295, which would add an option for smaller placards for IBCs carrying combustible liquids. As discussed in Sections III and IV of this proposed rule, this proposal does not change the safety requirements for the transportation or filling of an IBC. PHMSA expects that this proposal will provide regulatory flexibility to the regulated community without a reduction in safety. For these reasons, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

12. P-1736 – IME proposes that PHMSA IBR IME SLP-22 (2019), “Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials.” As discussed in Sections III and IV of this proposed rule, PHMSA conducted a technical review and examined each of these revisions included in SLP-22 (2019) and asserts that these changes will either maintain or enhance safety requirements. Additionally, PHMSA expects that this proposal will provide regulatory flexibility to the regulated community without a reduction in safety. The proposal may result in minor positive environmental impacts due to less packaging failures due to an increase in safety. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

13. P-1738 – PHMSA proposes modifying the definition of liquids in 49 CFR 171.8 to include the test for determining fluidity (penetrometer test), prescribed in section 2.3.4 of Annex A of the ADR. As discussed in Sections III and IV of this proposed rule, PHMSA asserts that the proposed test is more empirical in nature and provides better understanding of the properties of the tested material and thus better hazard classification. PHMSA expects that this proposal will

provide regulatory flexibility to the regulated community by offering an additional test method and will not result in a reduction in safety. As a result, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

14. P-1744 – PHMSA proposes to IBR the updated Appendix A of CGA publication C-7 (2020), “Guide to Classification and Labeling of Compressed Gases, Eleventh Edition,” into the HMR at 49 CFR 171.7(n)(8). As discussed in Sections III and IV of this proposed rule, this proposal updates a previously approved version of CGA C-7 and provides necessary technical updates and regulatory flexibility. PHMSA expects that this proposal will provide regulatory flexibility to the regulated community without any reduction in safety. As a result, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

15. P-1746 – PHMSA proposes to IBR CGA C-27 (2019), “Standard Procedure to Derate the Service Pressure of DOT 3-Series Seamless Steel Tubes, First Edition.” As discussed in Sections III and IV of this proposed rule, PHMSA has determined that the proposed method for pressure derating of tubes is essentially the same as what is outlined in current PHMSA guidance. PHMSA expects that this proposal will provide regulatory flexibility to the regulated community without a reduction in safety. Therefore, PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

16. P-1747 – PHMSA proposes to IBR CGA C-29 (2019), “Standard for Design Requirements for Tube Trailers and Tube Modules, First Edition,” which would supersede CGA TB-25 (2018), “Design Considerations for Tube Trailers.” As discussed in Sections III and IV of this proposed rule, PHMSA concludes that tube trailers or modules manufactured in accordance with CGA C-29 are less likely to have separation of tubes from the trailer or bundle, resulting in the unintentional release of hazardous materials, when subjected to multidirectional forces that

can occur in highway collisions, including rollover accidents. PHMSA expects that this proposal will increase safety for the transportation of hazardous materials in tube trailers because it may reduce the incidence of releases of hazardous materials due to failure of tube mountings.

Therefore, PHMSA does expect this proposal may have minimal positive environmental impacts.

PHMSA does not expect this revision to result in any increase to GHG emissions.

17. P-1748 - PHMSA proposes to incorporate by reference CGA V-9 (2019),

“Compressed Gas Association Standard for Compressed Gas Cylinder Valves, Eighth Edition.”

As discussed in Sections III and IV of this proposed rule, this proposal updates a previously approved version of CGA V-9 and provides necessary technical updates and regulatory flexibility. PHMSA expects that this proposal will provide regulatory flexibility to the regulated community without a reduction in safety. PHMSA does not expect this proposal to have any environmental impacts. Similarly, PHMSA does not expect this revision to result in any increase to GHG emissions.

#### 4. AGENCIES CONSULTED

PHMSA has coordinated with the Federal Aviation Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, the U.S. Coast Guard, and the Environmental Protection Agency in the development of this proposed rule. PHMSA solicits and will consider comments by members of the public, state and local governments, tribal communities, industry, and any other interested stakeholders regarding the NPRM's potential impacts on the human environment.

#### 5. PROPOSED FINDING OF NO SIGNIFICANT IMPACT

PHMSA expects the adoption of the “Proposed Action Alternative” will maintain the HMR's current high level of safety for shipments of hazardous materials transported by highway, rail, aircraft, and vessel, and as such finds the HMR amendments in the NPRM would have no

significant impact on the human environment. PHMSA expects that the “Proposed Action Alternative” will avoid any adverse safety, environmental justice, and GHG emissions impacts of the “No Action Alternative.” Furthermore, based on PHMSA's analysis of these provisions described above, PHMSA finds that codification and implementation of this rule would not result in a significant impact to the human environment.

PHMSA welcomes any views, data, or information related to environmental impacts that may result from NPRM's proposed requirements, the No Action Alternative, and other viable alternatives and their environmental impacts.

### *I. Environmental Justice*

DOT Order 5610.2C (“Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”) and Executive Orders 12898 (“Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”),<sup>42</sup> 13985 (“Advancing Racial Equity and Support for Underserved Communities Through the Federal Government”),<sup>43</sup> 13990 (“Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis”),<sup>44</sup> and 14008 (“Tackling the Climate Crisis at Home and Abroad”)<sup>45</sup> require DOT agencies to achieve environmental justice as part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects of their programs, policies, and activities on minority populations, low-income populations, and other underserved and disadvantaged communities.

PHMSA has evaluated this proposed rule under the above Executive orders and DOT Order 5610.2C. PHMSA does not expect the proposed rule, if finalized, to cause

---

<sup>42</sup> 59 FR 7629 (Feb. 11, 1994).

<sup>43</sup> 86 FR 7009 (Jan. 20, 2021).

<sup>44</sup> 86 FR 7037 (Jan. 20, 2021).

<sup>45</sup> 86 FR 7619 (Feb. 1, 2021).

disproportionately high and adverse human health and environmental effects on minority, low-income, underserved, and other disadvantaged populations and communities. The rulemaking is facially neutral and national in scope; it is neither directed toward a particular population, region, or community, nor is it expected to adversely impact any particular population, region, or community. And because PHMSA expects the rulemaking would not adversely affect the safe transportation of hazardous materials generally, PHMSA does not expect the proposed revisions would entail disproportionately high adverse risks for minority populations, low-income populations, or other underserved and other disadvantaged communities.

PHMSA submits that the proposed rulemaking could, in fact, reduce risks to minority populations, low-income populations, or other underserved and other disadvantaged communities. Because the proposed HMR amendments could avoid the release of hazardous materials and reduce the frequency of delays and returned/resubmitted shipments of hazardous materials resulting from conflict between the current HMR and updated international standards, the proposed rule could reduce risks to populations and communities—including any minority, low-income, underserved and other disadvantaged populations and communities—in the vicinity of interim storage sites and transportation arteries and hubs. Additionally, as explained in the above discussion of NEPA, PHMSA expects that its proposed HMR amendments will yield minimal GHG emissions reductions, thereby reducing the risks posed by anthropogenic climate change to minority, low-income, underserved, and other disadvantaged populations and communities.

PHMSA solicits comment from minority, low-income, underserved, and other disadvantaged populations and communities on potential impacts of the proposed rulemaking.

#### *J. Privacy Act*

In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform any amendments to the HMR considered in this rulemaking. DOT posts these comments,



without edit, including any personal information the commenter provides, to [www.regulations.gov](http://www.regulations.gov), as described in the system of records notice (DOT/ALL–14 FDMS). For information on DOT’s compliance with the Privacy Act, please see [www.dot.gov/privacy](http://www.dot.gov/privacy).

*K. Executive Order 13609 and International Trade Analysis*

Under Executive Order 13609, “Promoting International Regulatory Cooperation,” agencies must consider whether the impacts associated with significant variations between domestic and international regulatory approaches are unnecessary or may impair the ability of American business to export and compete internationally. (*See* 77 FR 26413 (May 4, 2012)) In meeting shared challenges involving health, safety, labor, security, environmental, and other issues, international regulatory cooperation can identify approaches that are at least as protective as those that are or would be adopted in the absence of such cooperation. International regulatory cooperation can also reduce, eliminate, or prevent unnecessary differences in regulatory requirements. This proposed rule does not negatively impact international trade.

*L. Executive Order 13211*

Executive Order 13211 (“Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use”) [66 FR 28355; May 22, 2001] requires Federal agencies to prepare a Statement of Energy Effects for any “significant energy action.” Under the executive order, a “significant energy action” is defined as any action by an agency (normally published in the *Federal Register*) that promulgates, or is expected to lead to the promulgation of, a final rule or regulation (including a notice of inquiry, advanced notice of proposed rulemaking (ANPRM), and NPRM) that: (1)(i) is a significant regulatory action under Executive Order 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) is designated by the Administrator of the Office of Information and Regulatory Affairs (OIRA) as a significant energy action.

This rulemaking has not been designated as a significant regulatory action and has not been designated by OIRA as a significant energy action. In addition, PHMSA does not anticipate that this rulemaking would result in a significant adverse effect on the supply, distribution, or use of energy. Therefore, PHMSA has not prepared an energy impact statement. PHMSA welcomes any data or information related to energy impacts that may result from this NPRM, as well as possible alternatives and their energy impacts. Please describe the impacts and the basis for the comment.

*M. National Technology Transfer and Advancement Act*

The National Technology Transfer and Advancement Act of 1995 (NTTAA; 15 U.S.C. 272 note) directs Federal agencies to use voluntary consensus standards in their regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., specification of materials, test methods, or performance requirements) that are developed or adopted by voluntary consensus standards bodies. Consistent with the goals of the NTTAA, PHMSA has adopted a significant number of voluntary consensus standards, which are listed in 49 CFR 171.7.

**List of Subjects**

*49 CFR Part 107*

Administrative practice and procedure, Hazardous materials transportation, Penalties, Reporting and recordkeeping requirements.

*49 CFR Part 171*

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Reporting and recordkeeping requirements, Definitions and abbreviations.

*49 CFR Part 172*

Hazardous materials transportation, Hazardous waste, Incorporation by reference, Labeling, Markings, Packaging and containers, Reporting and recordkeeping requirements.

*49 CFR Part 173*

Hazardous materials transportation, Incorporation by reference, Training, Packaging and containers, Reporting and recordkeeping requirements.

*49 CFR Part 178*

Hazardous materials transportation, Incorporation by reference, Motor vehicle safety, Packaging and containers, Reporting and recordkeeping requirements.

*49 CFR Part 180*

Hazardous materials transportation, Motor carriers, Motor vehicle safety, Packaging and containers, Railroad safety, Reporting and recordkeeping requirements.

In consideration of the foregoing, PHMSA proposes to amend 49 CFR chapter I as follows:

**PART 107—HAZARDOUS MATERIALS PROGRAM PROCEDURES**

1. The authority citation for part 107 continues to read as follows:

**Authority:** 49 U.S.C. 5101–5128, 44701; Pub. L. 101–410 Section 4; Pub. L. 104–121 Sections 212–213; Pub. L. 104–134 Section 31001; Pub. L. 114–74 Section 701 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97; 33 U.S.C. 1321.

2. In § 107.117, revise paragraph (a) to read as follows:

## **§107.117 Emergency processing.**

(a) An application is granted emergency processing if the Associate Administrator, on the basis of the application and any inquiry undertaken, finds that:

(1) Emergency processing is necessary to prevent significant injury to persons or property (other than the hazardous material to be transported) that could not be prevented if the application were processed on a routine basis;

(2) Emergency processing is necessary for immediate national security purposes;

(3) Emergency processing is necessary to prevent significant economic loss that could not be prevented if the application were processed on a routine basis; or

(4) Emergency processing is necessary in support of an essential governmental (domestic or foreign) function that could not be satisfied if the application were processed on a routine basis.

\* \* \* \* \*

## **PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS**

3. The authority citation for part 171 continues to read as follows:

**Authority:** 49 U.S.C. 5101–5128, 44701; Pub. L. 101–410 section 4; Pub. L. 104–134, section 31001; Pub. L. 114–74 section 701 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97.

4. In § 171.7:

a. Revise paragraphs (n) and (r)(1) and (2);

b. In paragraph (dd)(4), remove the text “§ 171.23” and add, in its place, the text “§§ 171.8; 171.23”; and

c. Add paragraph (dd)(5).

The revisions and addition read as follows:

### **§171.7 Reference material.**

\* \* \* \* \*

(n) *Compressed Gas Association (CGA)*, 8484 Westpark Drive, Suite 220, McLean, VA 22102; telephone 703-788-2700, [www.cganet.com](http://www.cganet.com).

(1) CGA C-1 - 2016, *Methods for Pressure Testing Compressed Gas Cylinders*, Eleventh edition, copyright 2016; into §§178.36; 178.37; 178.38; 178.39; 178.42; 178.44; 178.45; 178.46; 178.47; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.65; 178.68; 180.205; 180.209.

(2) CGA C-3 -2005 (Reaffirmed 2011), *Standards for Welding on Thin-Walled Steel Cylinders*, Seventh edition, copyright 2005; into §§178.47; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.65; 178.68; 180.211.

(3) CGA C-5, *Cylinder Service Life—Seamless Steel High Pressure Cylinders*, 1991 (Reaffirmed 1995); into §173.302a.

(4) CGA C-6 - 2013, *Standards for Visual Inspection of Steel Compressed Gas Cylinders*, Eleventh edition, copyright 2013; into §§172.102; 173.3; 173.198; 180.205; 180.209; 180.211; 180.411; 180.519.

(5) CGA C-6.1 - 2013, *Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders*, Sixth edition, copyright 2013 (corrected 4/14/2015); into §§180.205; 180.209.

(6) CGA C-6.2, *Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders*, Third edition, 1996; into §180.205.

(7) CGA C-6.3 - 2013, *Standard for Visual Inspection of Low Pressure Aluminum Alloy Compressed Gas Cylinders*, Third edition, copyright 2013; into §§180.205; 180.209.

(8) CGA C-7 (2020), *Guide to Classification and Labeling of Compressed Gases*; Eleventh Edition; into § 172.400a.

(9) CGA C-8, *Standard for Requalification of DOT-3HT Cylinder Design*, 1985; into §§180.205; 180.209.

- (10) CGA C-11 - 2013, Practices for Inspection of Compressed Gas Cylinders at Time of Manufacture, Fifth edition, copyright 2013; into §178.35.
- (11) CGA C-12, Qualification Procedure for Acetylene Cylinder Design, 1994; into §§ 173.301; 173.303; 178.59; 178.60.
- (12) CGA C-13, Guidelines for Periodic Visual Inspection and Requalification of Acetylene Cylinders, Fourth edition, 2000; into §§ 173.303; 180.205; 180.209.
- (13) CGA C-14 - 2005 (Reaffirmed 2010), Procedures for Fire Testing of DOT Cylinder Pressure Relief Device Systems, Fourth edition, copyright 2005; into §§173.301; 173.323.
- (14) CGA C-20 (2014), Requalification Standard for Metallic, DOT and TC 3-series Gas Cylinders and Tubes Using Ultrasonic Examination (Second Edition); into § 180.205.
- (15) CGA C-23 (2018), Standard for Inspection of DOT/TC 3 Series and ISO 11120, Tube Neck Mounting Surfaces (Second Edition); into §§ 180.205; 180.207.
- (16) CGA C-27 (2019), Standard Procedure to Derate the Service Pressure of DOT Series Seamless Steel Tubes (First Edition); into § 180.212.
- (17) CGA C-29 (2019), Standard for Design Requirements for Tube Trailers and Tube Modules (First Edition); into § 173.301.
- (18) CGA G-1.6 - 2011, Standard for Mobile Acetylene Trailer Systems, Seventh edition, copyright 2011; into §173.301.
- (19) CGA G-2.2 , Guideline Method for Determining Minimum of 0.2% Water in Anhydrous Ammonia, Second edition, 1985 (Reaffirmed 1997); into §173.315.
- (20) CGA G-4.1, Cleaning Equipment for Oxygen Service, 1985; into §178.338-15.
- (21) CGA P-20, Standard for the Classification of Toxic Gas Mixtures, Third edition, 2003; into §173.115.
- (22) CGA S-1.1 - 2011, Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases; Fourteenth edition, copyright 2011; into §§173.301; 173.304a; 178.75.

(23) CGA S-1.2, Safety Relief Device Standards Part 2—Cargo and Portable Tanks for Compressed Gases, 1980; into §§173.315; 173.318; 178.276; 178.277.

(24) CGA S-7 - 2013, Standard for Selecting Pressure Relief Devices for Compressed Gas Mixtures in Cylinders, Fifth edition, copyright 2013; into §173.301.

(25) CGA Technical Bulletin TB-2, Guidelines for Inspection and Repair of MC-330 and MC-331 Cargo Tanks, 1980; into §§180.407; 180.413.

(26) CGA Technical Bulletin TB-25 (CGA TB-25), Design Considerations for Tube Trailers, 2008 Edition; into § 173.301.

(27) CGA V-9 (2019), Compressed Gas Association Standard for Compressed Cylinder Valves, Eighth Edition; into §173.301.

\* \* \* \* \*

(r) \* \* \*

(1) IME Standard 22, IME Safety Library Publication No. 22, Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials, June 2019; into §§ 173.63; 177.835.

(2) IME Standard 23, IME Safety Library Publication No. 23, Recommendations for the Transportation of Explosives, Division 1.5, Ammonium Nitrate Emulsions, Division 5.1, Combustible Liquids, Class 3, and Corrosives, Class 8 in Bulk Packaging, March 2021, into §§ 172.102; 173.66; 173.251; 177.835.

\* \* \* \* \*

(dd) \* \* \*

(5) Recommendations on Test Series 8: Applicability of Test Series 8(d), June 2019; into § 172.102.

\* \* \* \* \*

5. In § 171.8, revise the definition of “Liquid” to read as follows:

## **§171.8 Definitions and abbreviations.**

\* \* \* \* \*

*Liquid* means a material, other than an elevated temperature material, with a melting point or initial melting point of 20 °C (68 °F) or lower at a standard pressure of 101.3 kPa (14.7 psia). A viscous material for which a specific melting point cannot be determined must be subjected to the procedures specified in ASTM D 4359 (IBR, see § 171.7) or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4. of Annex A of the Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) (IBR, see § 171.7).

\* \* \* \* \*

## **PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, TRAINING REQUIREMENTS, AND SECURITY PLANS**

6. The authority citation for part 172 continues to read as follows:

**Authority:** 49 U.S.C. 5101-5128, 44701; 49 CFR 1.81, 1.96 and 1.97.



7. In § 172.101, the Hazardous Materials Table is amended by **revising the** entries under “[REVISE]” **to** read as follows:

**§172.101 Purpose and use of hazardous materials table.**

\* \* \* \* \*

§172.101 Hazardous Materials Table

Symbols  (1)	Hazardous materials descriptions and proper shipping names  (2)	Hazard class or division  (3)	Identification Numbers  (4)	PG  (5)	Label Codes  (6)	Special Provisions (§ 172.102)  (7)	(8)			(9)		(10)	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Vessel stowage	
							Exceptions (8A)	Non - bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	[REVISE]												
	*****												
	Ammonium nitrate emulsion <i>or</i> Ammonium nitrate suspension <i>or</i> Ammonium nitrate gel, <i>intermediate for blasting explosives</i>	5.1	UN3375	II	5.1	147, 148, 163, IB2, IP16, TP48	None	231	251	Forbidden	Forbidden	D	25, 59, 60, 66, 124
	*****												
	Explosive, blasting, type E <i>or</i> Agent blasting, Type E	1.5D	UN0332		1.5D	105, 106, 148, TP48	None	62	None	Forbidden	Forbidden	03	25, 19E
	*****												
G	Oxidizing liquid, n.o.s	5.1	UN3139	I	5.1	62, 127, A2	None	201	243	Forbidden	2.5 L	D	56, 58, 138
				II	5.1	62, 127, 148, A2, IB2, TP48	152	202	242	1 L	5 L	B	56, 58, 138
				III	5.1	62, 127, 148, A2, IB2	152	203	241	2.5 L	30 L	B	56, 58, 138
	*****												

\* \* \* \* \*

8. In § 172.102:

- a. In paragraph (c)(1), revise special provision 148; and
- b. In paragraph (c)(8)(ii), add special provision TP48 in numerical order.

The revision and addition read as follows:

**§172.102 Special provisions.**

\* \* \* \* \*

(c) \* \* \*

(1) \* \* \*

148 For domestic transportation, this entry directs to § 173.66 of this subchapter for:

a. The standards for transporting a single bulk hazardous material for blasting by cargo tank motor vehicles (CTMV); and

b. The standards for CTMVs capable of transporting multiple hazardous materials for blasting in bulk and non-bulk packagings (i.e., a multipurpose bulk truck). Note: “UN3375, Ammonium nitrate emulsion” and “UN0332, Explosive, blasting, type E *or* Agent blasting, Type E” are subject to the United Nations (UN) Test Series 8(d) (IBR, see § 171.7 of this subchapter), otherwise known as the Vented Pipe Test (VPT).

\* \* \* \* \*

(8) \* \* \*

(ii) \* \* \*

TP48 The use of IM 101 and 102 portable tanks when transported in accordance with IME Standard 23 (IBR, see § 171.7 of this subchapter).

\* \* \* \* \*

9. In § 172.514, revise paragraph (c)(4) to reads as follows:

**§172.514 Bulk packagings.**

\* \* \* \* \*

(c) \* \* \*

(4) For an intermediate bulk container (IBC) labeled in accordance with subpart E of this part, the IBC may display the proper shipping name and UN identification number markings in accordance with § 172.301(a)(1) in place of the UN number on an orange panel, placard, or white square-on-point configuration as prescribed in § 172.336(d). Additionally, IBCs containing a combustible liquid may be placarded with a combustible placard that meets the label specifications for size in § 172.407(c). However, a transport vehicle containing IBCs with a reduced-size combustible placard is still required to conform to the placarding requirements in this subpart, including the size requirements in § 172.519(c); and

\* \* \* \* \*

## **PART 173 – SHIPPERS - GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS**

10. The authority citation for part 173 continues to read as follows:

**Authority:** 49 U.S.C. 5101-5128, 44701; 49 CFR 1.81, 1.96 and 1.97.

11. In § 173.4b, revise the introductory text to paragraph (a) to read as follows:

### **§173.4b De minimis exceptions.**

(a) When packaged in accordance with this section, the following materials do not meet the definition of a hazardous material in § 171.8 of this subchapter and therefore, are not subject to the requirements of this subchapter: Packing Group II and III materials of hazard Class 3, Division 4.1, Division 4.2, Division 4.3, Division 5.1, Class 8, and Class 9; and materials of hazard Division 6.1 (no inhalation hazard).

\* \* \* \* \*

12. In § 173.115, revise the introductory text to paragraph (e) to read as follows:

### **§173.115 Class 2, Divisions 2.1, 2.2, and 2.3—Definitions.**

\* \* \* \* \*

(e) *Liquefied compressed gas.* A gas, which when packaged under pressure for transportation is partially liquid at temperatures above –50 °C (–58 °F), is considered to be a

liquefied compressed gas. Gas mixtures with component(s) that are liquefied gases may be described using the hazardous materials description of a compressed gas in the 49 CFR 172.101 Hazardous Materials Table when the partial pressure(s) of the liquefied gas component(s) in the mixture are reduced so that the mixture is entirely in the gas phase at 20°C (68°F). A liquefied compressed gas is further categorized as follows:

\* \* \* \* \*

13. In §173.185, revise the introductory text to paragraph (c)(3) to read as follows:

**§173.185 Lithium cells and batteries.**

\* \* \* \* \*

(c) \* \* \*

(3) *Hazard communication.* Each package must display the lithium battery mark except when a package contains only button cell batteries contained in equipment (including circuit boards), or when a consignment contains two packages or fewer where each package contains not more than four lithium cells or two batteries contained in equipment.

\* \* \* \* \*

14. In § 173.251, add paragraph (a)(3) to read as follows:

**§173.251 Bulk packaging for ammonium nitrate emulsion, suspension, or gel.**

\* \* \* \* \*

(a) \* \* \*

(3) This section does not apply to “UN3375, Ammonium Nitrate Emulsion” when transported in IM 101 or 102 portable tanks in accordance with IME Standard 23 (IBR, see §171.7 of this subchapter).

\* \* \* \* \*

15. In § 173.301, revise paragraph (i)(2) to read as follows:

**§173.301 General requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles and spherical pressure vessels.**

\* \* \* \*

(i) \* \*

(2) Seamless DOT specification cylinders longer than 2 m (6.5 ft) are authorized for transportation only when horizontally mounted on a motor vehicle or in an ISO framework or other framework of equivalent structural integrity in accordance with CGA C-29 (IBR, see § 171.7 of this subchapter). Seamless DOT specification cylinders longer than 2 m (6.5 ft) manufactured prior to May 11, 2009, may continue to use CGA TB-25. The pressure relief device must be arranged to discharge unobstructed to the open air. In addition, for Division 2.1 (flammable gas) material, the pressure relief devices must be arranged to discharge upward to prevent any escaping gas from contacting personnel or any adjacent cylinders.

\* \* \* \*

16. In § 173.302a:

- a. Remove the semicolons at the ends of paragraphs (c)(1) and (2) and add periods in their places;
- b. Revise paragraphs (c)(3) and (4); and
- c. Add paragraphs (c)(5) through (7).

The revisions and additions read as follows:

**§173.302a Additional requirements for shipment of non-liquefied (permanent) compressed gases in specification cylinders.**

\* \* \* \*

(c) \* \*

(3) DOT specification 3A and 3AX cylinders are limited to those having an intermediate manganese composition.

(4) Cylinders manufactured with intermediate manganese steel must have been normalized, not quenched and tempered. Quench and temper treatment of intermediate steel is not authorized.

(5) Cylinders manufactured with chrome moly steel must have been quenched and tempered, not normalized. Use of normalized chrome moly steel cylinders is not permitted.

(6) Cylinders must be equipped with pressure relief devices sized and selected as to type, location, and quantity, and tested in accordance with § 173.301(f).

(7) A plus sign (+) is added following the test date marking on the cylinder.

\* \* \* \* \*

17. In §173.302b, add paragraph (f) to read as follows:

**§173.302b Additional requirements for shipment of non-liquefied (permanent) compressed gases in UN pressure receptacles.**

\* \* \* \* \*

(f) *Methane, compressed, or natural gas, compressed, UN1971.* Methane, compressed, or natural gas, compressed is authorized in a UN seamless steel pressure receptacle under the following conditions:

(1) For methane, and for natural gas with a methane content of 98.0 percent or greater—

(i) The maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 1100 MPa (159,542 psi); and

(ii) The contents are commercially free of corroding components.

(2) For natural gas with a methane content of less than 98.0 percent—

(i) The maximum tensile strength of the UN seamless steel pressure receptacle may not exceed 950 MPa (137,750 psi);

(ii) Each discharge end of a UN refillable seamless steel tube must be equipped with an internal drain tube; and

(iii) The moisture content and concentration of the corroding components must conform to the requirements in § 173.301b(a)(2).

18. In § 173.304, revise paragraph (d) to read as follows:

**§173.304 Filling of cylinders with liquefied compressed gases.**

\* \* \* \* \*

(d) *Refrigerant and dispersant gases.* (1) Nontoxic and nonflammable refrigerant or dispersant gases must be offered for transportation in cylinders prescribed in § 173.304a, or in DOT 2P, 2Q, or 2Q1 containers (§§ 178.33, 178.33a, and 178.33d-2 of this subchapter). DOT 2P, 2Q, and 2Q1 containers must be packed in strong outer packagings designed to protect valves from damage or accidental functioning under conditions incident to transportation. For DOT 2P and 2Q containers, the pressure inside the containers may not exceed 87 psia at 21.1 °C (70 °F). For 2Q1 containers, the pressure inside the container may not exceed 210 psig at 55 °C (131 °F). Each completed metal container filled for shipment must be heated until its contents reach a minimum temperature of 55 °C (131 °F) without evidence of leakage, distortion, or other defect. Each outer package must be plainly marked “INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS”.

(2) The following hydrofluorocarbons are prohibited from being filled or transported in non-refillable cylinders pursuant to the phaseout conditions identified in paragraphs (d)(2)(i) through (iii) of this section:

**Table 1 to Paragraph (d)(2) introductory text**

<b>Chemical name</b>	<b>Common name</b>
CHF <sub>2</sub> CHF <sub>2</sub>	HFC-134
CH <sub>2</sub> FCF <sub>3</sub>	HFC-134a
CH <sub>2</sub> FCHF <sub>2</sub>	HFC-143
CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-245fa
CF <sub>3</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>3</sub>	HFC-365mfc
CF <sub>3</sub> CHFCF <sub>3</sub>	HFC-227ea
CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub>	HFC-236cb
CHF <sub>2</sub> CHFCF <sub>3</sub>	HFC-236ea
CF <sub>3</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-236fa
CH <sub>2</sub> FCF <sub>2</sub> CHF <sub>2</sub>	HFC-245ca

CF <sub>3</sub> CHFCHFCF <sub>2</sub> CF <sub>3</sub>	HFC-43-10mee
CH <sub>2</sub> F <sub>2</sub>	HFC-32
CHF <sub>2</sub> CF <sub>3</sub>	HFC-125
CH <sub>3</sub> CF <sub>3</sub>	HFC-143a
CH <sub>3</sub> F	HFC-41
CH <sub>2</sub> FCH <sub>2</sub> F	HFC-152
CH <sub>3</sub> CHF <sub>2</sub>	HFC-152a
CHF <sub>3</sub>	HFC-23

(i) As of January 1, 2025, no person may:

(A) Import a non-refillable cylinder filled with a material identified in table 1 to paragraph (d)(2) introductory text of this section; or

(B) Fill a non-refillable cylinder with a material identified in table 1 to paragraph (d)(2) introductory text of this section.

(ii) As of January 1, 2027, no person may offer for transportation or transport a material identified in table 1 to paragraph (d)(2) introductory text of this section in a non-refillable cylinder.

(iii) A container with two pounds or less of net material listed in table 1 to paragraph (d)(2) introductory text of this section that has a self-sealing valve that meets the requirements in 40 CFR 82.154(c)(2) is not subject to this prohibition.

\* \* \* \* \*

## **PART 178—SPECIFICATIONS FOR PACKAGINGS**

19. The authority citation for part 178 continues to read as follows:

**Authority:** 49 U.S.C. 5101-5128; 49 CFR 1.81 and 1.97.

20. In §178.503, revise paragraph (a)(6) to read as follows:

### **§178.503 Marking of packagings.**

(a) \* \* \*

(6) The last two digits of the year of manufacture. Packagings of types 1H and 3H shall also be marked with the month of manufacture in any appropriate manner; this may be marked



on the packaging in a different place from the remainder of the markings. For boxes, the last two digits may alternatively be the year of certification;

\* \* \* \*

21. In § 178.601:

- a. Redesignate paragraphs (g)(6) through (8) as paragraphs (g)(7) through (9);
- b. Add new paragraph (g)(6); and
- c. Revise newly-redesignated paragraph (g)(8).

The addition and revision read follows:

**§178.601 General requirements.**

\* \* \* \*

(g) \* \*

*(6) Selective testing of combination packagings for small arms ammunition. Variation 6.*

Variations in inner and intermediate packagings are permitted in packages for articles containing solid hazardous materials without further testing of the package under the following conditions:

- (i) The package has been tested containing only the articles to be transported without intermediate containment;
- (ii) The outer packaging must have passed the stacking test set forth in § 178.606 when empty, i.e. without cushioning or inner or intermediate packagings with the test mass of identical packages being the mass of the package filled with the articles;
- (iii) Only articles tested without intermediate containment may be transported; however, a variety of articles tested in this fashion may be assembled in a package with intermediate containment;
- (iv) No articles demonstrate a loss of material in testing; and
- (v) The completed package does not exceed the marked maximum gross mass of the package.

\* \* \* \*

(8) *Approval of selective testing.* In addition to the provisions of paragraphs (g)(1) through (7) of this section, the Associate Administrator may approve the selective testing of packagings that differ only in minor respects from a tested type.

\* \* \* \* \*

## **PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS**

22. The authority citation for part 180 continues to read as follows:

**Authority:** 49 U.S.C. 5101-5128; 49 CFR 1.81 and 1.97.

23. In § 180.205:

- a. Add paragraph (c)(5);
- b. Remove the word “or” at the end of paragraph (d)(4);
- c. Redesignate paragraph (d)(5) as paragraph (d)(6) and add new paragraph (d)(5);
- d. Revise paragraphs (e)(2) and (f);
- e. Redesignate paragraphs (h) through (j) as paragraphs (i) through (k) and add new paragraph (h); and
- f. Revise newly-redesignated paragraphs (i)(1) and (j)(2)(i)(C).

The additions and revisions read as follows:

### **§180.205 General requirements for requalification of specification cylinders.**

\* \* \* \* \*

(c) \* \* \*

(5) Each 3-series specification cylinder that is horizontally mounted on a motor vehicle or in a framework and that is: 12 feet or longer; has an outside diameter greater than or equal to 18 inches; and is supported by the neck mounting surface during transportation in commerce must be inspected at the time of requalification in accordance with CGA C-23 (IBR, see §171.7 of this subchapter). If the due date of the tube neck mounting surface inspection required by CGA C-23 does not align with the periodic requalification due date of the specification cylinder, an

additional two years shall be allowed after the 10-year requalification due date to complete the neck inspection. After the expiration of the time period, including the two-year grace period, specification cylinders subject to the CGA C-23 inspection shall not be charged or filled but may be transported for the purposes of draining, purging, and performing required inspections.

(d) \* \* \*

(5) For a cylinder subject to paragraph (c)(5) of this section, if there is visible corrosion around the neck or under the flange/sleeve, as outlined in Section 4.2 of CGA C-23, it must be removed and examined in accordance with CGA C-23 before being returned to service; or

\* \* \* \* \*

(e) \* \* \*

(2) Requalified in accordance with this section, regardless of the date of the previous requalification. When requalification is performed using ultrasonic examination, the cylinder must be visually inspected in accordance with paragraph (e)(1) of this section;

\* \* \* \* \*

(f) *Visual inspection.* Except as otherwise provided in this subpart, each time a cylinder is pressure tested, it must be given an internal and external visual inspection.

(1) The visual inspection must be performed in accordance with the following CGA Pamphlets (all IBR, see § 171.7 of this subchapter): C-6 for steel and nickel cylinders; C-6.1 for seamless aluminum cylinders; C-6.2 for fiber reinforced composite special permit cylinders; C-6.3 for low pressure aluminum cylinders; C-8 for DOT 3HT cylinders; and C-13 for DOT 8 series cylinders.

(2) If a cylinder or tube is requalified by ultrasonic examination, only an external visual inspection is required.

(3) For each cylinder with a coating or attachments that would inhibit inspection of the cylinder, the coating or attachments must be removed before performing the visual inspection.

(4) Each cylinder subject to visual inspection must be approved, rejected, or condemned according to the criteria in the applicable CGA pamphlet.

(5) In addition to other requirements prescribed in this paragraph (f), each specification cylinder manufactured of aluminum alloy 6351-T6 and used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be inspected for sustained load cracking in accordance with appendix C to this part at the first scheduled five-year requalification period after January 1, 2007, and every five years thereafter.

(6) Except in association with an authorized repair, removal of wall thickness via grinding, sanding, or other means is not permitted. Removal of paint or loose material to prepare the cylinder for inspection is permitted (i.e., shot blasting).

(7) Chasing of cylinder threads to clean them is permitted, but removal of metal must not occur. Retapping of cylinder threads is not permitted, except by the original manufacturer, as provided in § 180.212.

\* \* \* \*

(h) *Ultrasonic examination (UE)*. Requalification of cylinders and tubes using UE must be performed in accordance with CGA C-20 (IBR, see §171.7 of this subchapter).

\* \* \* \*

(i) \* \*

(1) Except as provided in paragraphs (i)(3) and (4) of this section, a cylinder that is rejected may not be marked as meeting the requirements of this section.

\* \* \* \*

(j) \* \*

(2) \* \*

(i) \* \*

(C) As an alternative to the stamping or labeling as described in this paragraph (j)(2), at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure. If a condemned cylinder contains hazardous materials, the requalifier must stamp the cylinder “CONDEMNED” and affix a readily visible label on the cylinder stating: “UN REJECTED, RETURNING TO ORIGIN FOR PROPER DISPOSITION.” The requalifier may only transport the condemned cylinder by private motor vehicle carriage to a facility capable of safely removing the contents of the cylinder.

\* \* \* \* \*

24. In § 180.207, revise paragraph (d)(1) to read as follows:

**§180.207 Requirements for requalification of UN pressure receptacles.**

\* \* \* \* \*

(d) \* \* \*

(1) *Seamless steel.* (i) Each seamless steel UN pressure receptacle, including pressure receptacles exceeding 150 L capacity installed in multiple-element gas containers (MEGCs) or in other service, must be requalified in accordance with ISO 6406:2005(E) (IBR, see §171.7 of this subchapter). However, UN cylinders with a tensile strength greater than or equal to 950 MPa must be requalified by ultrasonic examination in accordance with ISO 6406:2005(E). For seamless steel cylinders and tubes, the internal inspection and hydraulic pressure test may be replaced by a procedure conforming to ISO 16148:2016(E) (IBR, see §171.7 of this subchapter).

(ii) Each seamless steel UN pressure receptacle that is horizontally mounted on a motor vehicle or in a framework and that: is 12 feet or longer; has an outside diameter greater than or equal to 18 inches; and is supported by a neck mounting surface during transportation must be inspected at the time of requalification in accordance with CGA C-23 (IBR, see § 171.7 of this subchapter). Notwithstanding the periodic inspection, if the seamless steel UN pressure receptacle shows visible corrosion, as outlined in Section 4.2 of CGA C-23, around the neck or

under the flange/sleeve, then it must be removed and examined in accordance with Section 6 of CGA C-23 prior to returning to service.

\* \* \* \* \*

25. In § 180.209:

- a. Revise paragraph (d) and the introductory text to paragraph (m); and
- b. Designate the table immediately following the introductory text to paragraph (m) as table 4 to paragraph (m).

The revisions read as follows:

**§180.209 Requirements for requalification of specification cylinders.**

\* \* \* \* \*

(d) *Cylinders 5.44 kg (12 lb) or less with service pressures of 300 psig or less.* A cylinder of 5.44 kg (12 lb) or less water capacity authorized for service pressure of 300 psig or less must be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in accordance with CGA C-6 or C-6.1 (IBR, see § 171.7 of this subchapter). The cylinder may be proof pressure tested. The test is successful if the cylinder, when examined under test pressure, does not display a defect described in § 180.205(j)(1)(ii) or (iii). Upon successful completion of the test and inspection, the cylinder must be marked in accordance with § 180.213.

\* \* \* \* \*

(m) *DOT-3AL cylinders manufactured of 6351-T6 aluminum alloy.* In addition to the periodic requalification and marking described in § 180.205, each cylinder manufactured of aluminum alloy 6351-T6 used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be requalified and inspected for sustained load cracking in accordance with the non-destructive examination method described in the following table. Each cylinder with sustained load cracking that has expanded into the neck

threads must be condemned in accordance with § 180.205(j). This paragraph (m) does not apply to cylinders used for carbon dioxide, fire extinguisher, or other industrial gas service.

\* \* \* \* \*

26. In § 180.212, add paragraph (a)(4) and revise paragraph (b)(2) to read as follows:

**§180.212 Repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles.**

(a) \* \* \*

(4) Derating service pressure of DOT 3-series seamless steel tubes. DOT 3-series seamless steel tubes with an outside diameter greater than 9 5/8 in (244.5 mm) may be processed by a repair facility for derating the marked service pressure in accordance with CGA C-27 (IBR, see § 171.7 of this subchapter).

(b) \* \* \*

(2) External rethreading of a DOT 3AX, 3AAX, or 3T specification cylinder or a UN pressure receptacle, and external threading of a seamless DOT 3AX, 3AAX, or 3T specification cylinder or seamless UN pressure receptacle originally manufactured without external threads; or the internal rethreading of a DOT-3 series cylinder or a seamless UN pressure receptacle when performed by a cylinder manufacturer of these types of cylinders. The repair work must be performed under the supervision of an independent inspection agency. Upon completion of the rethreading or post-manufacture threading, the threads must be gauged in accordance with Federal Standard H-28 or an equivalent standard containing the same specification limits. The rethreaded cylinder or UN pressure receptacle must be stamped clearly and legibly with the words “RETHREAD” and a post-manufacture threaded cylinder or UN pressure receptacle must be stamped clearly and legibly with the words “POST-THREAD”, on the shoulder, top head, or neck. No DOT specification cylinder or UN pressure receptacle may be rethreaded more than one time without approval of the Associate Administrator.

Signed in Washington, DC on February 14, 2023, under authority delegated in  
49 CFR 1.97(b).

**William S. Schoonover,**  
*Associate Administrator for Hazardous Materials Safety,  
Pipeline and Hazardous Materials Safety Administration.*

[FR Doc. 2023-03366 Filed: 3/2/2023 8:45 am; Publication Date: 3/3/2023]